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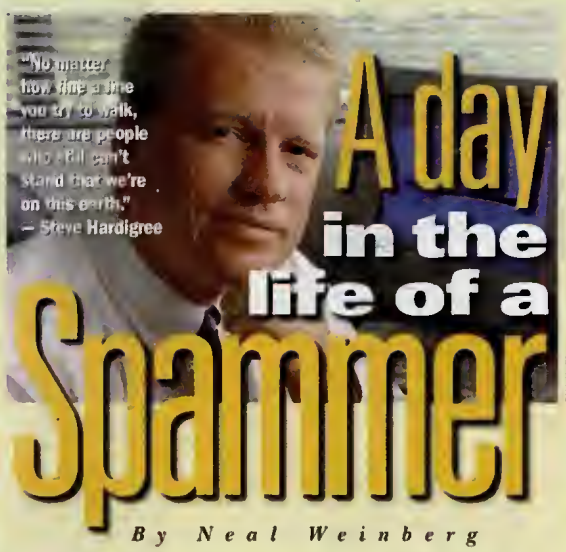
JUNE 22, 1998 VOLUME 15, NUMBER 25

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Tackling the Net Taxes

Congress attempts to sort out the issue of taxing electronic commerce. Page 10.



A day in the life of a Spammer

By Neal Weinberg

Boca Raton, Fla.

On a drizzly day in south Florida, Steve Hardigree is at the helm of his growing business: fielding sales calls, speaking to his accountant, signing off on a press release and, oh yes, showering the Internet with 100,000 unsolicited e-mails.

Hardigree, an affable, earnest 30-year-old with a marketing degree from Florida Atlantic University, describes what he does as targeted e-mail marketing, a legitimate, cost-effective alternative to snail-mail marketing, aka junk mail. But many of his cyber-recipients prefer to use the S-word when one of Hardigree's missives lands in their mailboxes — they call it spam.

Since he set up shop two and a half years ago, Hardigree has fielded angry phone calls, endured flame mails, fended off assaults from hackers, watched in horror as a denial-of-service attack crashed his system, and suffered the indignity of having his Internet connection cut off.

See Spammer, page 49

Will Nortel/Bay foster new era?

Multibillion dollar acquisition targets integration of data, voice and video.

By Jim Duffy and David Rohde
Brampton, Ontario

Though Northern Telecom Ltd.'s acquisition of Bay Networks, Inc. last week appears to usher in a new era for the network industry, the union still has to win over some skeptics.

The deal is predicated on the belief that users will rely on IP networks for transmitting everything from data to voice and video.

And with IP as the common protocol for connecting businesses and business applications, enterprise and service provider networks are no longer separate and distinct.

"It should change the landscape," said Craig Johnson, principal of PITA Group in Portland, Ore., of the Nortel/Bay deal.

See Nortel/Bay, page 68

THE DEAL

Executive insights

Read our interview with Nortel CEO John Roth and Bay CEO David House. Page 69.

Get more online:
- Lucent's enterprise efforts. FIND IT ONLINE 7639
- Bay and Nortel stock info.

NT terminals cost too much

By John Cox
New York

The new breed of Windows-based terminals, touted as low-cost desktop devices, may run into a problem: customers who think the devices are still too expensive.

The perceived high cost of the machines, compared with steeply dropping PC prices, could slow — if not stall — the adoption of thin Windows desktops.

Makers of the terminals were out in force here last week at PC Expo, where Microsoft Corp. announced the release of Windows NT Server 4.0, Terminal

See Thin clients, page 14

Netscape's helpers

By Andy Eddy
Mountain View, Calif.

As Godzilla stomps through movie theaters, Mozilla is starting to take its shape from a team of contributors around the globe.

Mozilla is the working name for Version 5.0 of Netscape Communications Corp.'s Communicator client software (*NW*, April 6, page 6).

What will set Communicator 5.0 apart from most other commercial products is the size of the development team working on it: basically a world of Netscape loyalists.

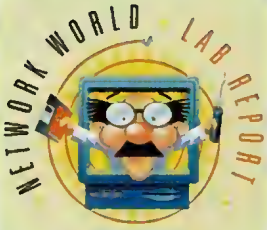
To respond to Microsoft Corp.'s market share gains with its Internet Explorer browser, Netscape has made the Mozilla source code available to the public.

Mozilla contributors are already working on:

- Building an all-Java browser.
- Porting Navigator to lesser-known operating systems such as Be, Inc.'s BeOS and the Commodore Amiga operating system.
- Creating versions of Navigator with strong security.
- Performing advanced Extensible Markup Language (XML) work for Communicator.

According to Jim Hamerly, vice president of client products at Netscape, the Communicator suite was broken out into 50 to 60 modules. Each module has an "owner" to oversee its development. Most owners are Netscape employees, but some modules

See Mozilla, page 12



Windows NT Special

- **Bulletproofing NT:** A new crop of tools provides server and NIC redundancy, ensuring high availability for your NT servers. Page 45.
- **Two steps toward thinner clients:** Microsoft's NT Terminal Server Edition deftly supports thin clients, while Citrix's MetaFrame add-on scales the product for the enterprise. Page 51.

Microsoft SQL Server.
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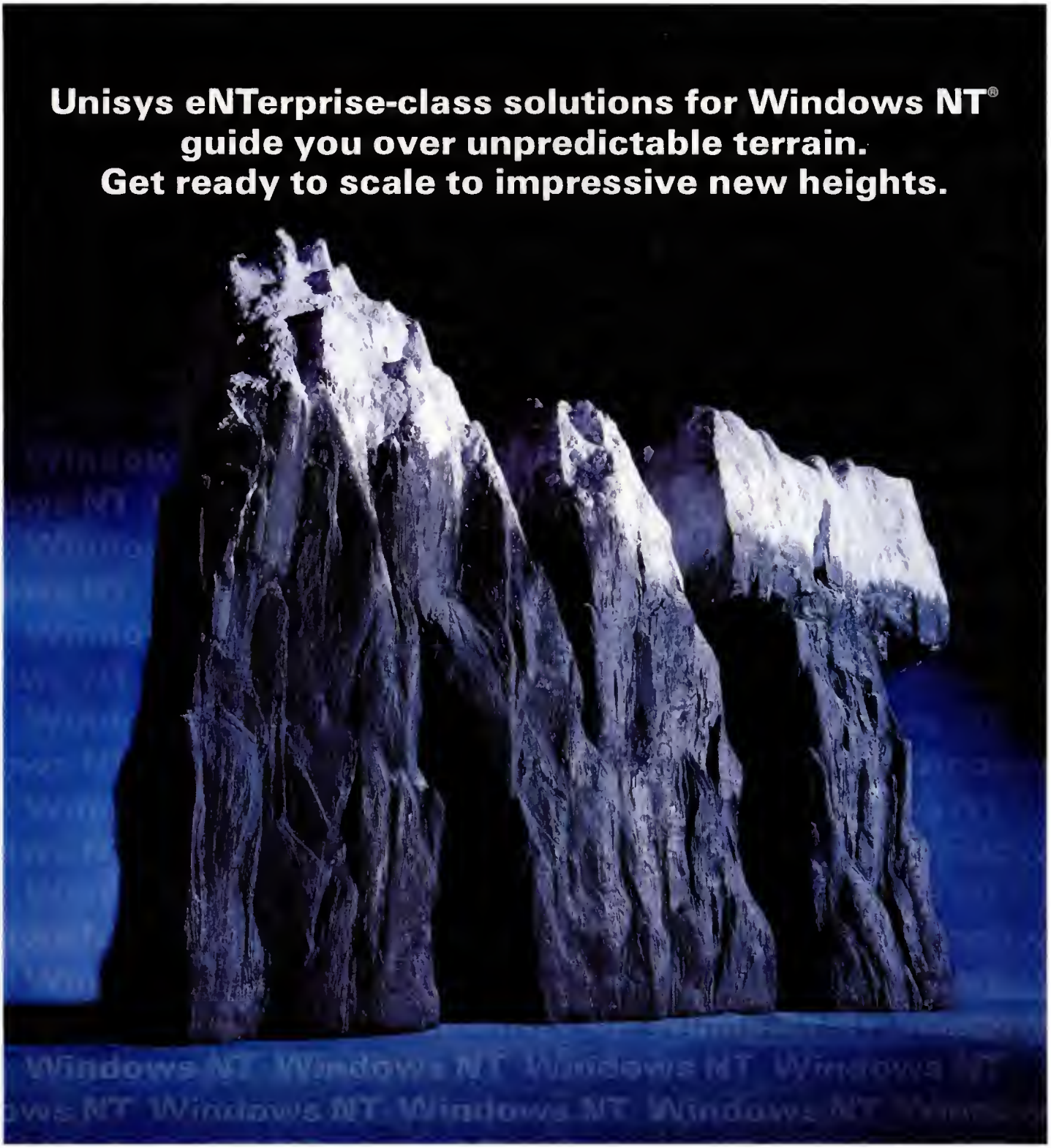

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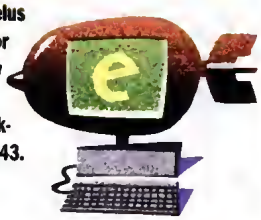
YOUNG TALENT

Intern Matt Murray helps MetaCreations fill junior-level tech positions. Page 57.

KIM KULISH

TICKING TIME BOMB?

Columnist James Kobielus says a new standard for e-mail push technology is in the works that could lay waste to backbone bandwidth. Page 43.



CAPTAIN VISION

Cisco's new Chief Technology Officer Judy Estrin looks to what the future holds for the router giant. Page 25.

JASON GROW

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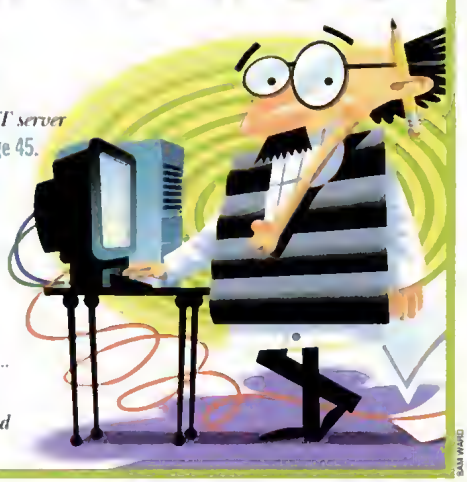

BAM WARD

SPECIAL FOCUS

Desktop management

Microsoft's Zero Administration Kit is relieving Windows management pain. Page 22.

FIND IT FUSION

To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.

NetworkWorld Fusion

www.nwfusion.com

This Week

Only on Fusion

E-mail. Last week, we reported on the burgeoning glut of e-mail. How are you dealing with the ever rising flood of mail in your in-box and on your network? Let's discuss it in our "E-mail hell" forum. **DocFinder: 7642**

Universal service. Our E-rate discussion continues to heat up. Are you willing to pay higher telecom rates to connect schools and libraries to the Internet? Does Internet access improve education? Join the debate. **DocFinder: 7546**

Name that Toon. We have a winner in our second "Name that Toon" caption contest. See the winner and the runners-up. **DocFinder: 7643**

Novell. Linda Musthaler's recent column on Novell's marketing woes, based in part on a similar NWFusion forum, generated a number of letters. See what readers had to say. **DocFinder: 7655**

News. Get a daily digest of network news delivered to your inbox with our NetFlash e-mail service. **DocFinder: 7644**

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News briefs, June 22, 1998

Vantive buys up Wayfarer

■ Vantive Corp. last week said it was acquiring privately held Wayfarer Communications, Inc., a provider of Web-based information delivery tools, for about $11.5 million. The acquisition will result in a new software product, called VantiveVista, that Vantive claimed will provide a customizable view of real-time information culled from front- and back-office applications.

Lucent hits Cisco with patent infringement charges

■ Lucent Technologies, Inc. last week filed a patent infringement lawsuit against Cisco Systems, Inc., alleging misuse of Bell Labs-developed routing, frame relay and ATM technology. The suit, filed in U.S. District Court in Delaware, charges Cisco with infringing on eight patents overall. "After numerous attempts to negotiate with Cisco, we were left with no other recourse but to file suit," said Michael Greene, Lucent's president of intellectual property. "We license our patents to many companies in the industry, and our goal is to receive fair value for Bell Labs' discoveries and innovations — innovations that are the result of more than $3 billion in annual investment. "Lucent will be seeking damages and an injunction prohibiting Cisco's use of its patents in the future. Cisco, which has not yet received a copy of the suit, is nonetheless "disappointed" by Lucent's action, a company spokeswoman said.

Novell applies Java muscle

■ Novell, Inc. applied fresh muscle to its server-side Java push last week by announcing the company will work with Intel Corp. on a souped-up Java Virtual Machine (JVM) for NetWare. Code-named NetFire, the enhanced JVM for NetWare will be optimized for running on Intel's 32-bit and future 64-bit chip architectures. Neither performance goals nor product details were announced, but the NetFire advancements are expected to appear in NetWare next year. Novell claimed the JVM in the company's soon-to-be-released NetWare 5.0 is already faster than those running in Windows NT and various flavors of Unix. Novell officials said NetFire will extend the company's advantage and attract more developers to NetWare, particularly those building transaction-intensive applications. More than 100 Java applications will be certified to run on NetWare 5.0.

That's entertainment

■ Seeking a gateway to the Internet befitting its status as a major entertainment corporation, Walt Disney Co. last week announced it has purchased a 43% stake in online search and directory service provider Infoseek Corp. In return, Infoseek, one of the most popular sites on the World Wide Web, will get $70 million in cash and ownership of Disney's Starwave, an online provider of entertainment, news and sports content. The combined Infoseek/Disney sites are estimated to have 23 million users. Disney and Infoseek officials said they will launch a service later this year featuring content from ABC.com, ABCNEWS.com, Disney.com and ESPN.com.

A little less pain in the pocketbook

■ AT&T last week announced it will lower its universal service surcharge on business voice and data services from 4.9% to 4.1%, starting July 1. The move came after the Federal Communications Commission altered the funding level for the federal E-rate program, which provides discounted Internet access for schools and libraries. Following a torrent of criticism, the FCC stretched the initial schedule for reimbursement of carriers and other E-rate vendors, lowering the amount required for E-rate during 1998 from $2.25 billion to $1.3 billion. The FCC declined to abolish E-rate or suspend collections for the program, a move urged by several prominent members of Congress and some user groups.

IBM one-stop vendor for host access

Big Blue announcing communications servers, integrated host product.

By Marc Songini
Research Triangle Park, N.C.

IBM this week will announce a range of tools that will put a Web face on legacy data.

Big Blue's eNetworking Software Division (eNS) will get things started when it announces the new eNetwork Host Integration Solution. The package ties together several individual Web-to-host products, allowing users to expand, secure and reconfigure their IP-to-legacy nets without having to buy separate products.

The suite contains the following:

- A version of the company's eNetwork Communications Server gateway, working with AIX, NT, OS/2 and eventually The Santa Cruz Operation, Inc.'s UnixWare.
- The eNetwork Host On-Demand Java terminal emulator.
- The eNetwork Personal Communications 3270 and 5250 emulator (which supports OS/2, DOS and Windows NT).
- The IBM eNetwork Communications Server for Windows NT.

With the Host Integration suite, users can access any 3270 and 5250 data, get to Java or ActiveX applications, or retrieve information from any Open Database Connectivity (ODBC) compliant database.

Question of security

IBM believes it's aiding users baffled by which type of connectivity package they should purchase.

For instance, do customers want OpenConnect Systems, Inc.'s TN3270 gateway, Attachmate Corp.'s host publishing system, Wall Data's 5250 emulation offering or a combination of these products? If they want a combination, users would have to pay separate licensing fees for each product, IBM argued.

There is also the question of security — each one of these access tools would require a different security product, IBM claimed.

IBM said the fee for Host Integration is $159 per user; having to assemble the IBM products separately would have cost about $400 per user.

The IBM strategy might not draw all users. "This might be great for integrating stuff in a quick-fix environment," said a network administrator who oversees an enterprise of 250,000 end users. "But it's not necessarily industrial strength."

NT Comm Server coming

In addition to introducing Host Integration, IBM announced two communications server packages. The first is Communications Server 6.0 for Windows NT, which will come bundled with Host Integration but can also be purchased separately. The second is Communications Server for UnixWare 7.0, a completely new product.

Comm Server 6.0 for Windows NT will have a raft of new features, the most important being the Host Publisher, which allows users to gather legacy data for conversion into HTML.

With the Host Publisher's Java, ActiveX and ODBC interfaces, users can attach a Web page to a host emulation screen and access data off of it.

"This will provide the customer with the capability to Webify any back-end data source," claimed R.T. Madey, product manager for eNetwork Servers.

New features

Comm Server 6.0 for NT also comes with other new features that IBM claims are not present in Microsoft Corp.'s SNA Server product. These features include:

- Enterprise Extender, which allows redundant SNA-over-IP sessions; if one session crashes, the other session will continue without the user being aware of the failure.
- Branch Extender, an Advanced Peer-to-Peer Networking technology, which automatically reconfigures branch office connections for greater speed of data transmission.
- Support for Tivoli Systems, Inc. TME 10 enterprise management software.
- MultiPath Channel data link control, which boosts the number of mainframe Enterprise Systems Connection links and speeds the data transfer rate.
- Secure Sockets Layer (SSL) protection, which offers authentication between TN3270e and TN5250 clients and servers at the session layer.

Communications Server for UnixWare 7.0, meanwhile, includes an SNA gateway, as well as High Performance Routing and APPN support. It will be bundled with Host Integration in July.

Comm Server 6.0 for NT and Comm Server for UnixWare 7.0 start at $995 for the base server and $69 per user.

✆ IBM: (800) 426-2468

CORRECTIONS

The *Network World* story "Extranets stress security safeguards" (June 8, page 41) incorrectly identified the CryptoCard as a product from Axent Technologies, Inc. The CryptoCard is manufactured by Toronto-based CryptoCard Corp. *Network World* regrets the error.

In the recent "OneWorld unveils one box for remote access" (*NW*, June 8, page 28), OneWorld System's former company name was incorrectly stated. The former name is Global Village Communication, Inc.

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Who wants more spam?

New venture is banking on the assumption that some people do.

By Paul McNamara
Stratham, N.H.

Would you cheerfully open your e-mail in-box to all the spam you can stand in exchange for a cut-rate ISP account?

Walt Rines, long reviled as one of the 'Net's most prolific spammers, is betting a new business that many e-mail users will leap at such an offer.

Rines, who now insists that he is a reformed spammer, said his new company has already signed up a dozen small ISPs to funnel commercial e-mail to willing recipients. Rines' Global Technology Marketing International (GTMI) provides ISPs with a free T-1 connection, and the advertisers, presuming they materialize, will pay GTMI a fee for the privilege of reaching a receptive audience.

GTMI will not be peddling spam, technically speaking. Spam is unsolicited commercial e-mail, and subscribers to GTMI-connected ISPs will be giving their explicit permission to have these e-mail advertisements pumped into their in-boxes, according to Rines.

His commercial e-mail network is slated to begin operation by the end of next month. GTMI itself will offer 56K bit/sec dial-up Internet access in 13 markets for either $11.95 per month, with advertising e-mail, or $19.95 per month, ad free. Rines said he doesn't know how many advertising messages will land in a typical customer's in-box, but he expects tolerance levels to vary widely.

Will the business plan work? Doubters abound, but there are e-mail experts and antispam activists who find the untried concept intriguing.

"The model that a spammer pays an ISP for mail to go in is absolutely the right model," said Paul Hoffman, director of the Internet Mail Consortium. "But that's only in the absence of other spam, because if other spam is still [able to get] through, why would a spammer ever want to do this?"

The answer, according to Rines, is so that these advertisers can avoid the wrath of antispam activists and the sting of increasingly frequent legal challenges being aimed at junk e-mailers. Just last week, for example, Hotmail, Inc. was awarded judgments ranging from $7,500 to $275,000 against a trio of spammers who had forged the company's domain name.

The notion of spammers being scared straight doesn't wash with everyone.

"[GTMI will] attract the former or would-be spammers who want the real appearance of legitimacy," said Alan Krueger, a software engineer and antispam activist. "[However,] the vast majority of spammers couldn't care less about legitimacy and won't take the perceived cut in revenue by going with an agency like GTMI that doesn't blast the 'Net at large."

Other GTMI skeptics question whether the scheme has sufficient revenue potential.

"I don't believe that GTMI will be able to pay enough to the ISPs to allow them to cut their rates," said Charles Hughes, an antispam activist and systems administrator for the Connecticut Department of Higher Education.

"Obviously, if they don't offer lower rates than other local ISPs nobody would bother to use them," Hughes said.

There are other pitfalls, too. Rines acknowledged that simple filtering techniques could allow a subscriber to reap the benefits of GTMI-produced price breaks without having to read any of the e-mail pitches. He said advertisers are aware of that possibility but seem willing to accept the risk.

On the optimistic side, one ISP executive who has already signed on with Rines said she expects the commercial e-mail network to be well received.

"I've talked to a number of my customers and they like the idea," said Patty Lindsey, president of AltiNet, Inc., an ISP in Dallas. Consumers will welcome special offers and price discounts on legitimate goods and services, she said.

Hoffman seconded that notion. "Remember, some people like junk mail," he said. "If Rines gets legitimate companies to send the [e-mail ads], I know people will like it."

One of the obstacles GTMI will face is the ill will Rines has generated in recent years as a practitioner and vocal proponent of spam. Although he says he has seen the error of those ways, not everyone is convinced.

"I wouldn't trust Rines if he put up a million-dollar bond," Hughes said. "Struggling ISPs probably won't be quite so picky though." ■

ISPs on board

These small ISPs are among a dozen participating in a fledgling commercial e-mail network organized by self-proclaimed former spammer Walt Rines.

- AltiNet, Inc., Dallas
- Anet, Inc., Los Angeles
- Benchmark Communications, Babylon, N.Y.
- Icon Internet, Oklahoma City
- Imedia, Inc., Arnold, Md.
- Jerky.Net, Boston

NetManage splurges to buy FTP Software

By Chris Nerney
Cupertino, Calif.

Last year, it was layoffs, losses and a lawsuit.

This year, PC connectivity software vendor NetManage, Inc. is in the black and back on track — so far, anyway.

Continuing an acquisition strategy designed to make it "the complete PC connectivity" software vendor, NetManage last week announced the $77 million acquisition of FTP Software, Inc., a vendor specializing in Java-based Web-to-host connectivity.

The deal, expected to be finalized in August pending stockholder and regulatory approval, involves a stock swap in which FTP shareholders will receive .73 shares of NetManage for each share of FTP.

NetManage has a wide range of connectivity software, including its Chameleon product line for connecting Windows PC users to IBM mainframe and AS/400 applications.

But NetManage has lacked software for "thin-client and multiuser NT host access," a company spokesman said. FTP's Java-based browser connectivity tools open up new market opportunities for NetManage, he said. In addition, FTP adds a large installed customer base and strong reseller and distribution channels to NetManage's arsenal, the spokesman said.

In the mid-1990s, FTP was riding high as a vendor of TCP/IP software for Microsoft Corp.'s operating systems. But Microsoft decided to include TCP/IP software stacks in Windows 95 and NT, essentially gutting FTP's main source of revenue.

Despite an effort to reposition itself as a network infrastructure software company featuring Java-based products, the company never recovered, posting a $57 million loss in 1997 alone.

NetManage appears to have recovered from a slide that began in 1996 and accelerated through last year. Revenue fell sharply in 1997, and the company posted $33.8 million in losses for the fiscal year, forcing a round of layoffs and resulting in the dismissal of Chief Financial Officer Walter Amaral last August.

Further, a group of shareholders filed a class-action lawsuit in March 1997, alleging insider trading and misrepresentation of financial information.

In the midst of this turmoil, NetManage embarked upon an acquisition strategy designed to fill out its product line. NetManage snapped up mid-range client/server software maker NetSoft of Irvine, Calif., for $26 million in July and mobile PC-to-host communications software vendor Relay Technology, Inc. of Vienna, Va., for an undisclosed sum last December.

Things began turning around for NetManage when it posted a $400,000 profit in the fourth quarter of 1997, followed by a $500,000 profit in Q1 1998.

A software licensing deal announced in late March with Intel Corp. sparked a brief trading frenzy in NetManage stock, which rose from about $3.50 per share to about $4.50 per share. Shares currently are selling for approximately $3 each.

Eight-year-old NetManage last year generated $62 million in revenue, putting the company at No. 162 on the Network World 200, an annual listing of the biggest companies in the network industry (*NW*, April 20). FTP, based in North Andover, Mass., ranked No. 153 with $68 million in revenue. ■

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Circle Reader Service #1

Xyplex touts secure router for VPNs

Separately, Internet Devices bolsters its Fort Knox virtual private network device.

By Tim Greene

Xyplex Networks, Inc. this week will announce EdgeGuardian, a router that includes the security technology needed by customers to set up virtual private networks (VPN) over the Internet.

The company's new EdgeGuardian device authenticates users and encrypts LAN and PC traffic for secure travel over the Internet.

Unlike some other VPN appliances, EdgeGuardian includes a full IP WAN router that can be used to connect directly to an ISP via a dedicated line.

That makes EdgeGuardian a good fit for remote offices that currently have no dedicated wide-area connection, according to Michael Howard, an analyst with Infonetics Research, Inc., a market research firm in San Jose, Calif.

Xyplex EdgeGuardian *combines a router with Internet VPN support.*

An Internet VPN can create a virtual dedicated link among a group of corporate sites for much less than it would cost to tie those same sites together using private lines, he said.

However, the device might not be the best choice for sites that already have a WAN router. The cost of scrapping the old router might outweigh the benefits EdgeGuardian brings, Howard said.

Also, the combined router/VPN appliance represents a single point of failure, according to Hung Bui, manager of desktop analysts for Alps Electric Co. in San Jose, Calif. "It's better to keep [the router and VPN devices] separate. When one goes bad, you just have to replace one," Bui said.

EdgeGuardian can establish encrypted sessions, called tunnels, with other EdgeGuardians. The encryption is based on the current draft of a proposed IP Security (IPSec) standard governing encryption and authentication.

The Xyplex offering can also establish tunnels with remote PCs running EdgeGuardian client software. PC users dial in to the Internet to establish connections to other corporate sites.

EdgeGuardian is a four-slot chassis with an integrated IP router that supports Routing Information Protocol, RIPII and Open Shortest Path First routing protocols. IPSec capabilities are incorporated in a separate card. WAN connectivity is supported via four-port T-1 and Primary Rate Interface ISDN cards and a one-port T-3 card. A modem card is planned for later this summer to allow direct dial and Internet remote access.

Xyplex also offers 10M bit/sec and 10/100M bit/sec Ethernet cards.

The chassis with one LAN, one WAN and one VPN card costs $9,995. EdgeGuard is shipping now.

Beefed up Fort Knox

Separately, VPN hardware vendor Internet Devices, Inc. has added bandwidth management to its Fort Knox family of VPN appliances.

Through a graphical interface, net managers can assign bandwidth limits by user or traffic type so important traffic always gets through.

Bandwidth Manager is one of two new SoftStack software options for Fort Knox. The other one is Fort Knox VPN SmartClient for remote Windows 95 PCs. Those remote users dial in to a local ISP, then tunnel through the Internet to a corporate site equipped with a Fort Knox box.

Fort Knox comes in three models that range in price from $1,995 to $9,995. SmartClient costs $995 per 25 users, $2,995 per 100 users and $9,995 per 1,000 users. Bandwidth manager costs $4,995.

✆ Xyplex: (508) 952-4700; Internet Devices: (408) 541-1406

Cisco unwraps Cougar switch

By Jim Duffy

San Jose, Calif.

Cisco Systems, Inc. last week unveiled its long-anticipated, next-generation ATM switch with the rollout of the Catalyst 8500 Multiservice Switch Routers (MSR).

Developed under the code name Cougar, the Catalyst 8500 MSRs are designed to switch and route cells and frames across enterprise and metropolitan-area networks (*NW*, July 28, 1997, page 1). The devices can be filled with a mix of new and existing ATM modules as well as existing Ethernet modules from Cisco's recently announced 8500 Campus Switch Router (CSR).

The Catalyst 8500 Multiservice Switch Router *comes in 5-slot, 5G bit/sec and 13-slot, 20G bit/sec flavors.*

Like the CSR, the MSR comes in two models: the five-slot 8510 and the 13-slot 8540. The Catalyst 8510 MSR provides an aggregate throughput of six million packet/sec for both ATM and Layer 3 switching and supports up to 32 fully routed 10/100M bit/sec ports, 32 155M bit/sec OC-3 ports and eight ports of 622M bit/sec OC-12. The 8510 MSR cards can run in the lower five slots of a Catalyst 5500.

The Catalyst 8540 MSR boasts an aggregate throughput of 24 million packet/sec. It supports up to 128 fully routed 10/100M bit/sec ports and up to 16 fully routed Gigabit Ethernet ports. It also supports as many as 128 ports of OC-3 ATM, up to 32 ports of OC-12 ATM or up to eight 2.5G bit/sec OC-48 ATM ports. Buffer queues on both switches are one million cells deep, Cisco said.

On the software side, the MSRs implement a variety of routing protocols, including hierarchical PNNI and tag switching. QoS features for both frames and cells include per-flow queuing, as well as weighted round-robin and rate-scheduling algorithms.

Even with all of these apparent benefits, some users found gaps in the 8500 MSRs. "One notable limitation is the base unit. It does not include access lists," said a user at an educational institution in the Midwest. "Hence, this switch doesn't seem to be appropriate in environments where security is important."

Access lists will be added later through the use of daughtercards that will attach to each interface module, the user said.

The Catalyst 8510 MSR starts at $27,500, and the Catalyst 8540 MSR starts at $59,000. The OC-12 line modules will list for $18,000 and the OC-48 modules for $35,000. The products will be available in the fourth quarter.

✆ Cisco: (408) 526-4000

Debate grows over taxing electronic commerce

By Ellen Messmer

Washington, D.C.

They may not like it, but buyers and sellers have long been used to paying state and local sales taxes on goods bought in stores or through mail-order firms.

The big question now is how state tax authorities can collect on goods sold over the Internet or whether they should try at all.

The House Judiciary Committee last week passed a revised version of the Internet Tax Freedom Act, legislation sponsored by Rep. Christopher Cox (R.-Calif.).

The legislation calls for the formation of a commission that would figure out how to tax electronic commerce transactions uniformly across all 50 states.

Congress has more work to do before the House and Senate settle on a final version of the bill, but businesses hope it won't take long. They say resolving the Internet tax issue is critical to their electronic commerce efforts.

"Any taxes on sales and services on the Internet is going to hinder growth," said George Barr, manager of interactive technology at Circuit City Stores, Inc. of Richmond, Va.

The retail store chain operates a Web site and has considered how it might sell electronics equipment online. Circuit City, which has 550 stores, even wants to provide digital distribution of video, music and software online.

Rep. Cox's *Net tax legislation gets a facelift.*

So far, the company has decided not to engage in electronic commerce because it would have to charge customers state and local sales taxes in each of the 45 states where Circuit City has a store.

While Barr acknowledged that physical stores do have their own advantages, he said Circuit City is not yet convinced it could operate profitably online against Web merchants that don't have to pay sales taxes because they don't have a physical presence in more than one state.

"Today the taxation of Internet sales is treated much like mail-order sales," Barr said. States want to tax a company if it is felt the firm has "nexus" — the legal expression for a physical business presence — in the state to which the company's goods are shipped.

"It's the issue of people with nexus vs. people without nexus," Barr said.

But some states are fearful that they will see their tax coffers dwindle if they can't collect on all goods sold via the Internet or services offered by online merchants. These states want to expand the concept of nexus as far as it can go — even to Web servers or telecommunications providers.

Texas last year tried to force anyone who sold goods through a server located in the state to pay sales taxes. But earlier this year, Texas quietly backed down. Separately, New Jersey and Connecticut are

See Nexus, page 14

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Browser battle continues with new betas

Microsoft airs developer preview of Internet Explorer; Netscape reveals Communicator 4.5 beta.

By Andy Eddy

Sound the bell — it's time for the next round of the Web browser fight.

Microsoft Corp. has just released a developer preview of Version 5.0 of its Internet Explorer Web browser. Separately, rival Netscape Communications Corp. last week said it will deliver a beta version of Communicator 4.5, the company's newest Web browsing client software. Both offerings are designed to make Web browsing a more efficient and interactive experience.

Microsoft's Internet Explorer 5.0 preview code is available to those who register at the company's SiteBuilder site (www.microsoft.com/sitebuilder). A download of the program comes with a strong warning of its instability.

According to Microsoft, features slated for Internet Explorer 5.0 include improvements for displaying pages and certain elements, such as tables; the ability to drag and drop links and elements between pages, frames and even other applications, such as Microsoft Office; and better stability to adequately handle elaborate applications.

Also included is support for such standards as dynamic HTML (DHTML), Cascading Style Sheets (CSS) and Extensible Markup Language (XML). DHTML and CSS enable designers to create pages with animation and add user interaction features, such as the ability for the user to alter page appearance on the fly. XML provides for consistent description and manipulation of data in Web applications.

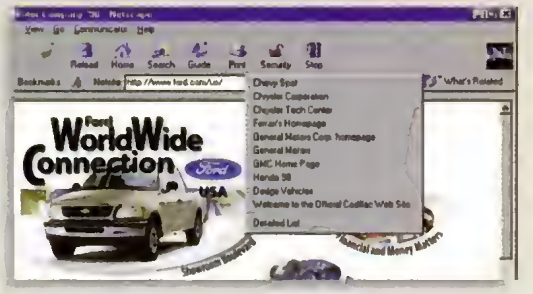
Microsoft has yet to announce a release date for Internet Explorer 5.0, but observers expect the software to ship next year.

Netscape's answer to Microsoft

Meanwhile, the Netscape camp released details about the upcoming Version 4.5 of its Web client software. Among the additions to the Navigator browser in this new version of Communicator is Smart Browsing, a series of features that facilitate navigation via keywords and complementary sites doled out by a Netscape database. The browser also can screen content based on Platform for Internet Content Selection site ratings.

A taste of things to come

Netscape's Communicator 4.5 sports new features such as a What's Related menu, which offers links to Web pages that are similar to the one currently being viewed in the browser.



In addition, Netscape has redesigned the Messenger e-mail application in Communicator to improve the filtering of messages into folders. Netscape also enhanced Messenger's handling of Internet Message Access Protocol and Lightweight Directory Access Protocol standards.

Communicator will also facilitate better synchronization between laptops and portable devices, such as 3Com Corp.'s PalmPilot.

This release of Communicator won't include any of the technology being developed under Netscape's Mozilla project, the company's effort to speed the evolution of its Communicator suite by publicly releasing the source code to the developer community.

Netscape indicated the public beta of Communicator 4.5 will last until the final version ships, most likely this fall. The company's Communicator 5.0, based on developments made under the Mozilla project, is due to be released in beta to the public by year-end.

One user said that Microsoft and Netscape might find themselves getting ahead of actual customer needs in rolling out the new Internet Explorer and Communicator features.

"All of these [additions like Smart Browsing] . . . are just bells and whistles that don't really affect my bottom line," said Rick Waugh, a system analyst with BC Telecom, Inc., a Vancouver company that has a mix of Microsoft and Netscape browsers on its desktops.

✆ Microsoft: (425) 882-8080; Netscape: (650) 254-1900

Mozilla

Continued from page 1

within the Mozilla project, particularly ports to lesser operating systems, are owned by people outside the company.

After a March 31 release to the public, the curious and the dedicated took off for the nearest mirror of the source code. Netscape claims there were more than 200,000 downloads of the source code in the first two weeks of its availability.

The first development came from a band of programmers in Australia calling itself the Mozilla Crypto Group. According to the group, within 15 hours of the source-code release, a working version of Cryptozilla was completed, providing "full-strength cryptographic functionality" through an implementation of Netscape's Secure Sockets Layer.

Similarly, other outside groups are taking on elaborate objectives, such as a work-in-progress version code-named Jazilla. This all-Java port of Mozilla is expected to replace Netscape's Javagator, an all-Java browser that was announced but later shelved during the company's reorganization earlier this year.

Another important development was the release of an advanced XML parser created by James Clark, one of the creators of XML and technical lead of the World Wide Web Consortium (W3C), the group that works with companies to evolve the Web through the development of protocols and standards.

In Netscape's early days, new features added by the company to its browser became de facto standards. But Netscape is now relying on the Internet community for direction.

"We're working with the W3C [on the development of standards]," said Netscape's Hamerly. "Everything we're doing is fully compliant with the evolving standards. We're not going to ride shotgun like we did before, particularly in the XML and [dynamic HTML] areas."

Hamerly noted four key benefits that are being derived from the Mozilla project:

- Bug fixes: As Hamerly said, "more eyes brings a more solid product," and there have been improvements to Communicator's stability as a result.
- New features: A larger pool of "product managers" produces ideas that Netscape's own team may not have thought of or implemented.
- More platforms: Netscape has always benefited from its strong cross-platform approach, but porting to minor operating systems, such as BeOS and Commodore Amiga, would be a poor use of resources. The porting of Mozilla to those operating systems by outside groups satisfies "orphaned" users and expands the visibility of the Netscape brand.
- Product modularization: By dividing the product into smaller parts, Mozilla provides for easy modification of individual elements and enables developers to embed modules into other applications. Microsoft is making a strong push to add Internet connectivity into some products; Mozilla modularity gets Netscape into the same process with other software companies.

Netscape seems to be steadily gaining back some industry support, which appeared to wane after the company's problematic start this year. Tim Sloane, director of Internet research for Aberdeen Group, Inc., a Boston-based consultancy, has been a harsh critic of Netscape in the past, but he's expressed cautious optimism over recent strategy and product announcements, as well as the potential of the Mozilla project.

"I'm not sure that Netscape is aware of what [it has] and how well it can be leveraged as a development platform — but I think that [independent software vendors] will figure it out, so I have high hopes on it. It could be a real core component of what Netscape is all about if [the company plays its] cards right," Sloane said. ■

TRACKING PROGRESS

The Mozilla site allows contributors to see the latest changes to each part of the source code under the Concurrent Versions System (CVS). CVS provides the most current code version at the time it's downloaded.

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Nexus

Continued from page 10

reputedly moving swiftly to adopt rules that will enable them to collect taxes on Internet sales.

"In Connecticut, you can buy the *Wall Street Journal* and have it delivered to your door, with no tax. But if you subscribe to it online, you have to pay the Connecticut Information Services Tax," said Mark Nebergall, vice president of finance and tax policy at the Software Publishers Association.

The Multistate Tax Commission, an interest group for the states on tax matters, has advocated that states consider the telecommunication provider of each online merchant as "nexus," in order to collect a sales tax on Internet sales.

This has outraged the telecom industry. "They're suggesting the telecom company is the agent of the retailer," said Pat Nugent, MCI Communications Corp.'s director of tax legislative affairs. "This makes the messenger shootable. It's absurd."

Wisconsin, though, just passed a law stating that telecom providers and ISPs can't be considered an "imputed agency" for purposes of sales tax collection.

A business think-tank group called the National Tax Association Communications and Electronic Commerce Tax Project has suggested letting states collect a sales tax based on where the credit card of the Internet buyer is registered.

But other think tanks claim the problem of taxing Internet buyers may be unsolvable under traditional rules, particularly when it comes to digital goods and services.

"Nexus and sourcing issues are more difficult for electronic commerce than any other medium," said Ken Lassman, regulatory analyst at a public advocacy group called Citizens for a Sound Economy.

A state's interest in auditing businesses to learn about their 'Net sales may raise privacy issues in the future, Lassman said.

Some state legislators mulling Internet tax collection agree that consumer privacy may become a hot topic.

"All of us should be concerned about a fishing expedition by government agencies," said Colorado Rep. Bob Hagedorn during last week's American Legislative Exchange Council meeting, which was devoted to the Internet tax problem.

There are estimated to be at least 30,000 state and local tax jurisdictions across the country, and large companies know well the problems of having to make tax filings for each one.

"If you're selling goods online, you have access to every jurisdiction in the world," commented Pat Hunnicutt, program manager for finance and taxation at IBM. "IBM thinks existing tax principles should be applied to the Internet. But we don't need a newfangled tax system just for the Internet."

But as Congress works on different drafts of the Internet Tax Freedom Act, it seems more likely the public will hear about new ways states should be allowed to uniformly collect sales tax on Internet-based transactions and even professional services, which go largely untaxed today.

And although the House and Senate versions of the Internet Tax Freedom Act call for a 'moratorium' on new taxes for three years, this rule would apply only to Internet access taxes, not sales on goods sold through electronic commerce. ■

TAX TALK

Facts about the latest version of the Internet Tax Freedom Act, passed by the House Judiciary Committee:

- Prevents states or local entities from imposing taxes on Internet access, "bit" taxes, or "multiple or discriminatory taxes" on electronic commerce.
- Allows states where Internet access charges have already been applied to continue collecting these fees. These states include Connecticut, Wisconsin, Iowa, North Dakota, South Dakota, New Mexico, Tennessee and Ohio. The District of Columbia and the 12 "home-rule" Colorado cities also will be allowed to continue to collect fees.
- Establishes the Advisory Commission on Electronic Commerce, consisting of federal and state representatives, representatives from electronic commerce and Internet access companies, as well as taxpayers.

Thin clients

Continued from page 1

Server Edition (TSE), a multiuser version of NT. Nearly all the devices demonstrated last week range in price from $599 to $1,289. Some models are priced higher.

However, Motorola Corp. and Acorn Group PLC have announced designs that could eventually let manufacturers drop prices to about $200.

For now, users are stuck with today's prices. "The terminal makers have just not gotten into the game and are way out of line on the pricing," asserted Bill Botti, president of Computer Networks, Inc., a Pleasanton, Calif., systems integrator that specializes in thin-client computing.

The prices are deterring users from replacing existing text terminals, sometimes called "green screen" terminals, he claimed.

"We could multiply by 10 times the number of [Windows-based terminals] we sell if we were at the right price point," Botti said.

A trio of TSE beta sites have looked at the terminals and decided they won't be buying them any time soon. The beta sites cited as reasons a lack of floppy disk support, slow performance compared with Pentium-based PCs, and falling PC prices.

"If I were looking at terminals priced in the $250 range, I'd be tickled," said Rick Smith, vice president of information systems at HOB Entertainment, Inc., the West Hollywood, Calif., parent of the House of Blues restaurant chain.

"I can buy a Pentium PC with lots of disk and RAM and pay $800 to $1,000 once I include a network card and some other stuff," he said.

Smith is going ahead with an aggressive deployment of TSE servers at the restaurant sites because he can manage these from headquarters and speed up deploying new applications. But the users will be sitting at PCs equipped with special client software to access the server applications.

"It's going to be a very tough market to crack without a distinct price advantage," said Keith Gray, senior geophysical consultant with Amoco Corp.'s exploration and product technology group. "I'm going to be buying PCs unless there is a compelling price differential."

The Administrauve Services division of the University of California Los Angeles evaluated Windows-based terminals and was disappointed.

"They're a lot slower than PCs," said Jack Tchiligrian, software specialist with the division's IS department. "For the price and the cost effectiveness, we'd rather get a PC and let the user run everything else that's not running on the TSE servers."

Tchiligrian said he is not impressed by the terminal vendors' claims of improved management and a stable software environment. "We're using standard software, most of it Microsoft products, which are integrated and work fine," he said. "And whenever something breaks, we just go and fix it."

Microsoft itself has made it clear to terminal vendors that the company brings to the TSE market the same focus on market share, high volume and low cost that it brings to its other products.

"We think the [high-] volume devices will be in the $500 range," said John Fredericksen, Microsoft group product manager for TSE. "But there will be a market for, say, $800 devices, because some customers will want more management features or performance."

Relief in sight

It's unclear how long the vendors will be able to maintain their current prices, especially as two major companies, Motorola in the U.S. and Acorn Group in Britain, have announced Windows-based terminal reference designs that would cost between $70 and $110 for manufacturers to build.

"With the system case, power supply, and margins for the manufacturers and channel distributors, the $199 price for the finished system [excluding monitor] is quite easily achievable," said Steve France, Acorn's senior marketing manager for information appliances.

Motorola managers said two top-tier PC builders are in serious talks with them about adopting the Motorola Wincept design.

These manufacturers are attracted by the opportunity to sell tens of thousands of low-cost terminals that would have to be attached to more expensive and higher margin servers, according to Bob Morris, operations manager with Motorola's personal computing division.

That's what front-line terminal deployers like Botti are waiting for.

"The first guy who delivers a $500 Windows-based terminal to end users will get market share," Botti predicted. "And market share in an exploding market is the name of the game." ■

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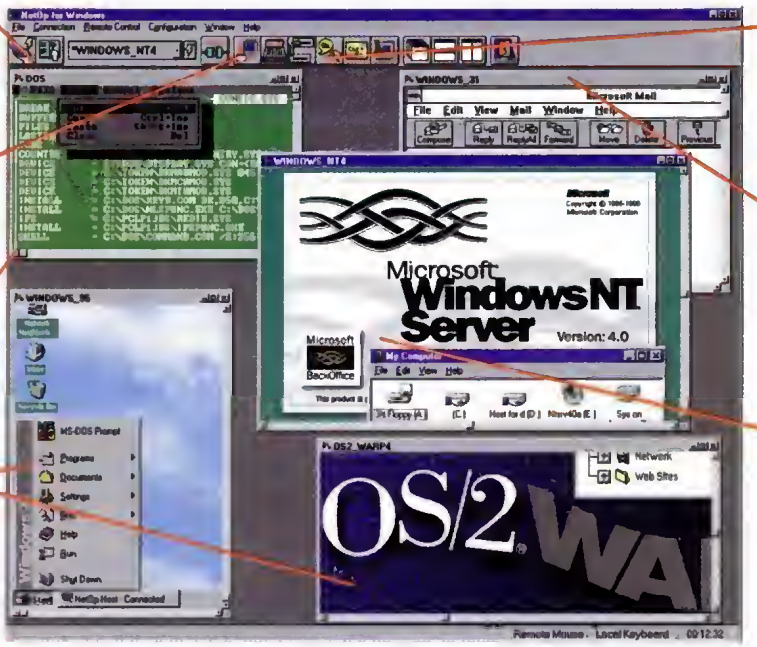

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Briefs

■ **Toshiba Computers Systems Division** *last week introduced a* **line of Windows NT PC servers** *The Magnia 3000 workgroup server and Magnia 5000 departmental server each support one or two 350-MHz or 400-MHz Pentium II chips. They also support 64M bytes of memory, include a 10/100M bit/sec network interface and come bundled with Intel Corp.'s LANDesk Server Manager 3.01 software. The two servers offer most of the same features, though the 5000 has more storage bays and comes with redundant cooling fans. The 3000 starts at $3,000 and the 5000 starts at $4,000. The servers will be available next month.*

Toshiba's Magnia 3000 server

© Toshiba: (800) 867-4422

■ *Antivirus software maker* **Sophos, Inc.** *is looking to win over users unhappy with Network Associates, Inc.'s pending acquisition of Dr. Solomon's Group plc. Sophos is offering Network Associates and Dr. Solomon's customers* **free copies of Sophos Anti-Virus software.** *To qualify, customers need to have bought a license for antivirus software from Network Associates or Dr. Solomon's before the companies announced plans to unite. The offer runs until Aug. 31.*

© Sophos: (888) 767-4679

■ *Switch start-up* **BlazeNet, Inc.** *has named* **Bruce Cohen** *as its CEO and president. Cohen previously was CEO and president of NovaSoft Systems, Inc. Prior to that he spent 10 years at Chipcom Corp. Cohen replaces Barry Spinney, who will become chief technology officer. BlazeNet, of Framingham, Mass., recently introduced the AppSwitch 2000, a combination LAN and WAN switch.*

Alliance targets phone wiring for LANs

By Robin Schreier Hohman

Some of the biggest names in the computer industry are coming together to create standards that will let users easily and inexpensively network PCs and other devices over existing telephone wiring.

Founding members of the Home Phoneline Networking Alliance — including IBM, AT&T, Lucent Technologies Inc., Intel Corp., Advanced Micro Devices, Inc., 3Com Corp. and Compaq Computer Corp. — will make a formal announcement today introducing the alliance and inviting other technology companies to join.

The group's goal is to develop devices such as adapter cards that will create an Ethernet LAN over existing phone wiring using standard phone jacks. This strategy would give users an inexpensive way to create a network for sharing Internet access, printers and other peripherals, files, applications and games.

But the alliance products will not be useful for linking remote users. Right now, devices have to be within 500 feet of each other to connect over the phone lines. The first products from the group, due by year-end, will support data rates of 1M bit/sec.

The technology would support voice, data and fax transmissions over the same phone line at the same time. The alliance's plan is to employ transmission frequencies that aren't being used by traditional voice calls, so users would be able to connect to the Internet while simultaneously speaking on the phone.

"We're not just a group about specs, but we're all working to bring technology to market quickly," said David Sanford, the 3Com representative for the group. While Sanford declined to go into specifics about products, the devices most likely to be developed will be network interface cards for PCs and laptops, adapters for printers and other peripherals, and adapters for consumer devices such as video cameras.

The alliance standard will support up to 25 PCs on a single link. The technology could also be used in larger offices to tie together small workgroups of users or to give users dial-up Internet access and voice capabilities over one phone line.

This technology could also give users a simple, secure way to synchronize laptops with workstations without having to assign IP addresses or tap into the network. The phone-line network could also become a simple way to synchronize home PCs with office laptops without having to fiddle with direct access connections.

The founding companies have been working together for several months, adding members and trying to convince standards bodies that there is a need to network devices over existing phone lines.

By next year, the alliance hopes to come up with standards for phone-line networks that operate at 10M bit/sec.

The members also plan to submit a proposal to the International Telecommunication Union and IEEE standards bodies. The first specifications are scheduled to be published by the fall, and the first products are expected to ship by year-end.

Go to http://www.phonelan.org for more information. ■

HOME PHONELINE NETWORKING ALLIANCE

Founding members: 3Com, AMD, AT&T, Compaq, Epigram, HP, IBM, Intel, Lucent, Rockwell Semiconductor and Tut Systems

Mission: To ensure adoption of a single unified phone-line network standard and to rapidly bring to market a range of small office (up to 25 nodes over distances of up to 500 feet) and home network products.

Initial applications supported: Shared Internet access, shared peripherals, file sharing and networked games.

Web site: www.phonelan.org

Bay reveals more Optivity 9.0 details

Release will merge several apps, leave management platforms behind.

By Jim Duffy
Santa Clara, Calif.

When Bay Networks, Inc. rolls out Version 9.0 of its Optivity network management software suite in the fourth quarter, the package will include a handful of previously separate applications that together should provide users with quicker access to critical network health data.

These integrated applications will be in addition to Optivity 9.0's support for multivendor device configuration features, which Network World Fusion reported on last month.

Optivity Enterprise Health Advisor and Network Atlas will be among the applications that Bay combines and includes in Optivity 9.0. These programs monitor device status and network topology, respectively. By combining the technologies, Bay will enable users to view a network's health as well as discover and map devices upon booting up the Optivity Enterprise Command Center console, said Craig Easley, Bay's product line manager for network management.

Bay has added support for the company's Accelar routers to its Optivity 9.0 discovery and mapping applications, Easley said.

Bay will also meld three performance-monitoring applications under Optivity 9.0. Optivity LAN Summary, OmniView and Nodal View collect Remote Monitoring fault and performance statistics and let users compare network traffic and diagnostic data across multiple hubs and switches. With Optivity 9.0, users will be able to access this data from a single application rather than launch three separate packages, Easley said.

All of the consolidated applications will be written in Java, which means that customers should be able to run or view them on any platform. Currently, most Optivity applications run on Unix. However, Bay will roll out a Windows NT edition of the Optivity Enterprise Command Center console with Version 9.0, Easley said.

One other change in Optivity 9.0 is that customers will not need to run the Bay software in conjunction with an enterprise management platform. Currently, Optivity must run on top of a platform such as Hewlett-Packard Co. OpenView or SunNet Manager. Version 9.0 will perform its own discovery, mapping and event handling, Easley said.

"[Optivity 9.0] will integrate with OpenView if customers have [the HP product], or it will run alone," Easley said. "We're not going to require customers to buy a platform."

Optivity 9.0 will ship by year-end. An enterprise version will cost about $20,000, Bay said.

✆ Bay: (408) 988-2400

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- A look at Bay's application-based management strategy
- Latest news on the Nortel/Bay acquisition

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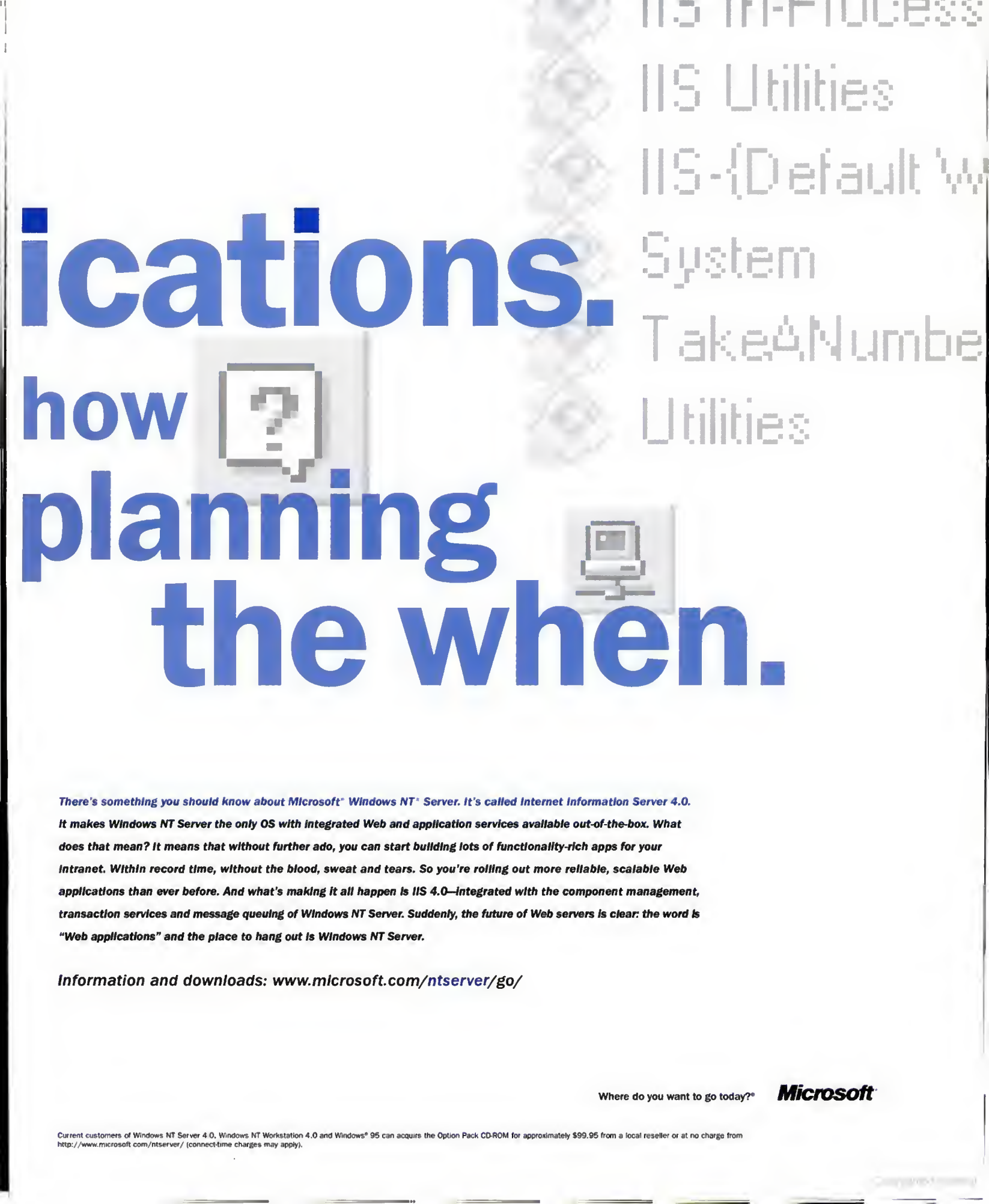


There's something you should know about Microsoft® Windows NT® Server. It's called Internet Information Server 4.0.

It makes Windows NT Server the only OS with integrated Web and application services available out-of-the-box. What does that mean? It means that without further ado, you can start building lots of functionality-rich apps for your intranet. Within record time, without the blood, sweat and tears. So you're rolling out more reliable, scalable Web applications than ever before. And what's making it all happen is IIS 4.0—integrated with the component management, transaction services and message queuing of Windows NT Server. Suddenly, the future of Web servers is clear: the word is "Web applications" and the place to hang out is Windows NT Server.

Information and downloads: www.microsoft.com/ntserver/go/

Where do you want to go today?® Microsoft®

Current customers of Windows NT Server 4.0, Windows NT Workstation 4.0 and Windows® 95 can acquire the Option Pack CD-ROM for approximately $99.95 from a local reseller or at no charge from http://www.microsoft.com/ntserver/ (connect-time charges may apply).

WIRED WINDOWS

My e-mail treasure chest

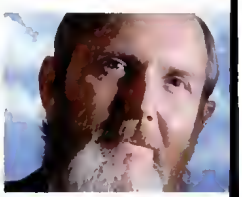
I firmly believe that electronic mail is the greatest boon to mankind to come out of the technological revolution. Each day, I hold discussions with more people — in more places — than I ever did in a week of face-to-face or telephone conversations. Likewise, I get more news and information daily through e-mail than in a week's worth of newspapers.

Each day, between 200 and 300 messages pass through my in-box, bringing family news, the thoughts of "Wired Windows" readers, the musings of fellow writers and the insights of other hockey fans. There's also the daily or weekly newsletters about topics I'm interested in as well as the everyday dose of diatribes, scams and beyond-belief press releases.

Let me share just a few with you. Some weeks ago, fellow *Network World* columnist Mark Gibbs and I "faced off" on Network World Fusion's online forum about the U.S. Department of Justice and Microsoft. Last week, I got an e-mail (all in caps, with lots of exclamation points) telling me just how wrong I was and how right Gibbs was in our arguments. After an interminable exegesis of the case, showing me where I was wrong, point by point, the writer ended by stating that he much preferred reading "Wired Windows" to Gibbs' "Backspin" column.

Of course, I prefer that my readers agree with me, but I guess it's better to be read and thought wrong than not to be read at all . . .

Also last week, I received an e-mail press release from a Windows NT management company that shall remain nameless. The release claimed that the application can "virtually [eliminate] configuration and knowledge requirements for . . . managing Microsoft Windows NT-based enterprise systems." The perfect product for those paper Microsoft Certified Systems Engineers . . .



Dave Kearns

The third message I want to share started out like an Ed McMahon sweepstakes letter — "As a valued customer, you have been nominated. . . ." The letter went on to reinforce the exclusive nature of this offer ("Your name is now part of the exclusive list. . . .").

Was this another multilevel marketing scheme? No, the note actually came from Microsoft's NT 5.0 beta team. Seems that someone (not Microsoft) was sponsoring a seminar on NT 5.0 and using Microsoft's beta tester list for marketing. The exclusive offer I'd been nominated for was only going to cost $1,295, plus airfare, food and lodging expenses — one heck of a deal. Could Microsoft be laying the groundwork for a new business model after the DOJ suit concludes?

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

The folks at Traveling Software have mated their LapLink connectivity package with Innovative Software's PC cloning tool, Ghost, to create an offering called LapLink Tech. The package provides remote control, print redirection, disk cloning, virus protection and more. It's sort of a Swiss Army Knife for the help desk and support staff. Check out the details and take a test drive at www.travsoft.com.

The Web and X. Together at last.

EASY INSTALLATION • ONLINE SUPPORT

If I had thumbs, they'd be up. Way Up.

They call it Broadway. X Windows applications within a web browser made its technological debut in **Chameleon™ UNIX® Link 97.** *As you bring up the lights, you point and click to link the office PCs to UNIX servers. Dazzle your audience with central administration, remote configuration, and high-speed NFS. In act two, Chameleon supports web access to UNIX, AS/400, and mainframes. The grand finale is* **built-in SupportNow™,** *playing to rave reviews for its real-time support that cuts your call time in half. After all, the show must go on. Get your show on the road today. Visit our web site at* **www.netmanage.com** *for a free download. Or give us a call at* **408-973-7171**.

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SPECIAL FOCUS

Desktop management

Microsoft's ZAK attack

By John Cox

Microsoft Corp. has made plenty of noise over the past couple of years about helping customers lower the total cost of their desktop ownership. But the company's most promising tools are still a good six months away.

Microsoft's Zero Administration for Windows (ZAW) strategy will really start to take shape next year when the company delivers Windows NT 5.0 and key technologies such as Active Directory.

In the meantime, the company has been getting its ZAW message across mainly via the Zero Administration Kit (ZAK). Microsoft introduced ZAK about a year ago, shortly after outlining the ZAW initiative, an effort within Micr lower total cost of ownership (TCO) development priority. ZAK actually has added nothing new in the way of technology. However, it has called attention to a handful of existing, but largely invisible, Windows 95 and NT 4.0 features that IS managers can use to control desktop computers across a network.

"My division is looking at ZAK because of the TCO issues," says a lead systems analyst with an Eastern wood products company, who asked not to be named in light of a company policy. "Today, we have no [management] structure around the So about 3,500 users can install anything they want. They're not supposed to, but they do."

The 'Net has made the problem even worse because users can download software from remote servers and install it on their PC hard drives.

"The problems that result are poor integration and lack of compatibility with the business software that is mission-critical," the analyst says. "And [then there's] the cost of support involved in figuring out what the users did to break their system."

ZAK attack

ZAK helps customers take advantage of features in Windows and NT that enable the setting of policies and end-user profiles. Policies are rules, and profiles are descriptions of a class or group of users to whom the rules apply.

"[Policies and profiles are] about controlling the desktop configuration, as this appears to the user," says David Hamilton, product manager with Microsoft's Windows Management Infrastructure group.

A systems administrator, for example, might want to keep sales representatives focused on just a handful of applications. Using policies and profiles, the administrator can limit the options that appear on the users' "Start" menu or even the "Programs" list. End users see only the key applications that they need to do their jobs.

ZAK offers extensive documentation on how to use policies and procedures to, in effect, idiot-proof desktop PCs. If users can't make changes, the thinking goes, they can't create problems that require a computer support specialist's time.

"We want to help customers reduce their costs by reducing the number of times that a help desk staffer has to visit a desktop computer," says Victor Raisys, a lead product manager for the Windows Management Infrastructure group. "If we can limit what a user can do to change their desktop, we can limit the changes that might require a visit from the help desk."

ZAK also includes two ready-to-use desktop profiles: TaskStation Mode and AppStation Mode. Taskstation Mode sets up a PC desktop to show and run just one application, such as an advertising sales application or a customer support application. Appstation Mode controls when and how office workers can run standard business applications.

This range of control appeals to MIS professionals, many of whom are trying to create a corporate desktop that's stable enough for successive waves of software updates.

"We've got PCs all over," says Brian Redmond, a technical analyst with the corporate IT group at PPG Industries, Inc., a glass company in Pittsburgh. "When users are constantly changing things it makes it very hard to roll out an application. We simply can't move to the next version."

Redmond's colleague Larry Berger, an NT systems engineer at PPG, is evaluating how to use NT policies, with or without ZAK, to "lock down" PCs and prevent users from interfering with critical applications.

"Using policies, we should be able to control access to specific objects on the desktop," he says. "Basically, any change an administrator can make in the Registry [akin to a local configuration database for each PC], can be turned into a policy and applied through a profile to a group."

Beyond ZAK

There are several other technologies available for Windows platforms that extend desktop management and complement ZAK. These include the Windows Scripting Host (WSH), which is intended as the successor to DOS batch files, and the Microsoft Management Console (MMC), a framework for third-party management programs.

"I think [WSH] will become the unsung hero of the whole [Microsoft desktop management story]," says Adrian King, a software consultant and author of the upcoming Microsoft Press book, *Introducing Microsoft NT Version 5.0.*

WSH is designed to handle management scripts, which are small programs that run specific tasks. WSH takes scripts, written in Visual Basic Script or another popular language, and matches them with the appropriate interpreter. WSH then runs the scripts.

MMC can be thought of as one of those all-purpose tools advertised on UHF television stations: a battery-powered handle with replaceable attachments that does 1,001 chores from chipping paint to mixing cocktails.

"Today, you have lots of separate management utilities like disk defragmenters and file managers," King says. "MMC is a host for these utilities. It's intended to unify the look and feel and operation of these tools."

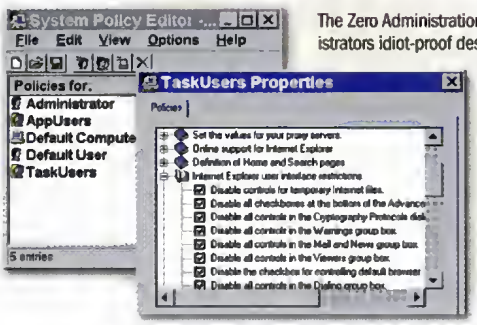
Symantec Corp., for example, recently announced the Norton System Center, which will eventually consolidate several Symantec tools starting with Norton AntiVirus.

Norton System Center incorporates MMC interfaces, enabling customers to access the Symantec program from the common MMC user interface.

MMC will let administrators create a bundle of selected tools for a given set of management tasks, such as TCP/IP network administration or desktop configuration management, according to King.

Microsoft's ZAK has proven valuable in boosting customer awareness about existing NT and Windows 95 features that can be used to control desktop management costs. But most of the big advances in this area will only be available when Windows NT 5.0 arrives. ■

ZAK: MICROSOFT'S DESKTOP CONTROL TOOL



The Zero Administration Kit (ZAK) helps administrators idiot-proof desktop PCs. Here, using the System Policy Editor, the administrator sets up a PC in TaskStation Mode, which is a preset ZAK user profile. In this configuration, the PC boots up directly into Internet Explorer or a specific line of business application.

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Briefs

■ *Host connectivity vendors* **Esker S.A.** *and* **Teubner & Associates, Inc.,** *last week announced they will* **merge.** *According to company executives, the merged firm will have annual revenue of approximately $25 million. The company will offer a variety of SNA-to-TCP/IP and Web-to-host gateways, as well as fax/document distribution wares.*

✆ Esker: (415) 675-7777; Teubner: (405) 624-8000

■ **Virtual Access, Inc.** *last week announced the completion of* **testing and certification of its Virtual Access LinXpeed Pro** *ISDN router with AT&T's ISDN Basic Rate Interface network management specification. The certification allows LinXpeed users to isolate and diagnose network problems on local exchange carrier access lines, Virtual Access said. Customers can conduct provisioning and maintenance analysis of network termination devices or customer premises equipment without having to coordinate testing with the local telephone company. The companies also announced a joint marketing agreement to sell ISDN network services and network management equipment.*

✆ Virtual Access: (703) 934-6180

■ **Compaq Computer Corp.** *demonstrated at Supercomm '98 a combination modem that* **supports 56K bit/sec** *analog connections and asymmetric digital subscriber line (ADSL). The PC card, called Blizzard Board, was demonstrated using chips from Lucent Technologies, Inc. and Alcatel Network Systems. The board would give users options for remote access: dedicated ADSL, 56K bit/sec modem or both simultaneously over an ADSL line. Compaq would not say when it will sell Blizzard Board.*

✆ Compaq: (281) 370-0670

Cisco's Estrin: Chief visionary officer

Executive outlines company's voice and policy-based net directions; evaluates competition.

Q&A

Judy Estrin has been an innovator and catalyst behind industry changes for many years. From 3Com Corp.'s acquisition of Bridge Communications 11 years ago to Cisco's recent purchase of Precept Software, Inc., Estrin's companies have always had something the Big Boys want. Perhaps it was Estrin herself? *Network World* Senior Editor Jim Duffy recently spoke with Cisco's visionary new chief technology officer about where she sees Cisco going.

How does Cisco make a decision whether to partner with a company, acquire the company or develop technology internally?

I would say sometimes it's a very carefully thought out plan, and sometimes it's opportunistic. There are certain areas where the company looks at [an acquisition and asks] do we have that core technology, should we go look at partnering or look at acquiring? There are other places where we may come across a really great company and even though we have some of the expertise, we may choose to acquire. There are places where for time-to-market reasons we may acquire. But then there are other areas where we may look and say no, this is really a core competency that we have and let's go develop it. It's all about understanding what our strengths and weaknesses are and where we want to own a technology vs. partnering. [That's] pretty much the same way that most companies make that decision.

Integrated into the culture here is we're moving too fast to do everything ourselves. Looking to somebody else to help us via a partnership or an acquisition is not a sign of weakness, it's a sign of strength. It means that we're looking forward. I think that's one of the fundamental differences that I've seen at Cisco from some other companies.

How deeply will Cisco get into voice? Are we going to see Cisco-branded central office switches or PBXs?

Cisco is very serious about [voice]. As you see more and more voice capability migrating to packetized voice as opposed to circuit-switched voice. The first phase of voice/data integration is really integrating it into the infrastructure with

JASON GROW

See Estrin, page 26

IBM backs away from partnering for key products

By Marc Songini

IBM is trying to break the habit of depending on other vendors to round out its product lines.

After a number of failed relationships with vendors such as Cascade Communications Corp. and Shiva Corp., IBM executives are now saying they will offer mostly home-grown products. The plus side for users is that they will get IBM-built and maintained products. Case in point: IBM's new Ethernet hubs and switches (*NW,* June 15, page 1) and any forthcoming Gigabit Ethernet products. The potential downside, however, is that IBM may not get products to market quickly enough.

In the past, critics accused IBM of suffering from the "not invented here" syndrome — a malady marked by a strong distaste for selling products that weren't developed in-house. But Big Blue changed all that over the past few years by partnering with Chipcom Corp. (now a subsidiary of 3Com Corp.), Centillion Networks, Inc. (now owned by Bay Networks, Inc.) and others (see graphic). But IBM executives now say some of those relationships did not pan out and provided little in the way of leading-edge gear for users.

"We're going to be doing less with partnering," said Donald Haile, vice president of development for IBM's Networking Hardware Division. "We expect we'll have one or two [partnerships], but we think six is crazy.

"We saw we had holes in our portfolio, and we tried to fill them temporarily," Haile continued. He mentioned that some partnering cost IBM a lot of money because the partners' product had to be redesigned to IBM specifications; in two cases, the partnership never paid off at all. The relationship with Cascade to build high-end switches never resulted in any boxes being delivered. The IBM and Shiva teaming was intended to deliver remote access gear, but nothing ever materialized. Both partnerships are now defunct.

"Historically, IBM's philosophical approach to each partnership assured they would fail," said Nick Francis, president of the Cary, N.C.-based consultancy, Madison Group. "[Because] it never partnered with an equal or a leader."

On the other hand, some relationships have been good for users, the partner vendor and IBM. For example, the reselling arrangement IBM has with Xylan has been profitable for both firms. And Xylan's backbone Ethernet switches fill in big holes in IBM's Ethernet product line.

IBM says it will build most of its future Ethernet and Gigabit Ethernet products on its own.

One IBM user said he did feel more reassured by knowing his products were all based on IBM technology. But despite this move, it all comes down to what company has the lowest price, said Jerry Wetherington, systems coordinator for the University of Florida in Gainesville. ■

PARTNERING WITH BIG BLUE

IBM's partnerships brought the following technologies to Big Blue:

Company	Purpose
Xylan	Provide hub and switching products
Sync Research	Provide frame relay technology
Cascade	Develop high-power ATM switch (relationship now defunct)
3Com	Help develop hubs and switches
Shiva	Help develop remote access technology (relationship now defunct)
Cisco	Provide Layer 2 switching technology (via Kalpana)

Estrin

Continued from page 25

PBXs and data.

The second phase of [voice/data integration] is truly integrated applications where you have PBX technology built on packet-based nets. I think you will see Cisco be a big player in both of those areas.

When I hear or think of policy-based network initiatives, like CiscoAssure, I'm reminded of virtual LANs, which didn't really take off. Will policy-based networks become the next VLANs? Will users find that the benefits of policies aren't worth the time or cost of implementation?

I don't think [they're the next VLANs] because we need some of these internetwork services like [quality of service], like security, to do what we need to do. VLANs were more a case of how you organize your network, and so there were ways around them. And the fact of the matter is, if you have an application that needs QoS, you need a way to set the policy on the QoS.

I think VLANs were driven by a 'How do I find a proprietary lock-in to keep my customers coming to me?' [vendor philosophy]. That's why they failed. I think things like CiscoAssure are driven by a need the customer has that we need to find the right way to fulfill.

So CiscoAssure won't be a proprietary offering?

I'm not saying that there aren't proprietary pieces to it. Sometimes companies have proprietary pieces because standards don't exist. In the early stages of the market, that's the way you do it. And then you interface to other people with APIs. But you don't want to come up with a feature just to have something proprietary. If you look at Cisco's early technology in routing protocols, it has some proprietary protocols because the standards didn't exist at the time. The customer needed that functionality.

So you look at a customer need and you say, 'OK, are there standards that exist to solve this need?' If there are, you use the standard; if there are no standards then you need to come up with some proprietary technology to use for that. But as long as [a technology] is driven by customer requirement, it has a much higher chance to succeed than if it's driven by something [where] the vendors sit back and say, 'Ohhhh, how can I come up with something new to lock the customer in?'

Now if I could get your thoughts on some recent industry events such as Tellabs' acquisition of Ciena. . . . What's Cisco going to do for wave-division multiplexing now?

Work with Ciena. We have a partnership with Ciena, and I don't see this changing it at all. I don't see Tellabs as a direct competitor of Cisco. I think we'll continue to have a strong partnership there.

Lucent's new PacketStar routers — threat or menace?

Clearly, Lucent moving into the data space [will make Lucent] our key competitor. In some ways [Cisco CEO] John Chambers likes to say we've left our traditional competitors behind, although you never ignore [them], whether looking over your back or looking forward. No question that anything Lucent does is something we take seriously and we watch. On the other hand, what they don't have is the IP expertise that Cisco has. ■

Get more online:

- Interviews with Estrin in her Precept Software days
- Interviews with other Cisco executives on where the company is headed

www.nwfusion.com

Take everything you know about frame relay and forget it.

Visual UpTime shatters the idea of unreliable frame relay.

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Visual UpTime® shatters preconceived notions on frame relay reliability by radically improving performance and availability. How? Visual UpTime monitors and troubleshoots frame relay in real time so you can quickly resolve network problems and maintain optimum performance. And no system monitors SLA parameters better than Visual UpTime, with Web reports on SLA metrics such as throughput, delay, and availability. Together these capabilities ensure the WAN reliability and performance you've been demanding for critical business applications.

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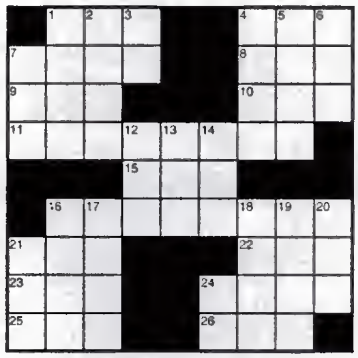


See sun.com/puzzle for answers.

Sun microsystems

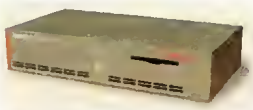
LET'S JUST SAY, YOU MAY HAVE SOME EXTRA TIME ON YOUR HANDS.

Briefs

Infonet Services Corp. *last week announced managed security services that protect customer intranets and LANs from intrusions.* **Infonet Managed Firewall Service,** *based on Check Point Software Technologies, Ltd.'s FireWall-1, defines security policies that can be distributed across multiple gateways and managed remotely by Infonet's Network Security Center. The security service allows access from company intranets to the Internet, while barring access from the Internet to intranets, with the exception of e-mail. Pricing varies by region.*

✆ Infonet: (310) 335-4700

Netrix Corp. *of Herndon, Va., last week introduced* **Network Exchange 2201,** *a device that lets users support voice over IP and voice over frame relay. Netrix's latest voice-over-data device is designed for small and remote offices. The base device supports four voice*



Netrix *Network Exchange 2201*

ports, a single Ethernet port and one serial port. The 2201 will be available in August for $3,500 to $4,995.

✆ Netrix: (800) 949-2737

Apex Global Internet Services, Inc. (AGIS), *a Dearborn, Mich.-based ISP, recently announced it plans to offer high-speed digital subscriber line (DSL) Internet access services. AGIS inked a $220 million deal with* **Nortel** *to deploy Nortel's I-Meg Modem DSL Lite and DMS switch equipment to support the IM bit/sec Internet access service. AGIS is rolling out its I-Meg Modem service this fall in Detroit, Seattle, San Jose, Calif., and Herndon, Va. Pricing is not yet available.*

✆ AGIS: (313)730-1130

Williams set to deliver flexible services

New service network features let users control bandwidth, billing and management.

By Tim Greene
Tulsa, Okla.

Williams Communications Group is promising to give network service users something they have precious little of today: flexibility.

The company is building a service network that will let users check on the status of circuits and rapidly change the amount of bandwidth they are getting. In addition, Williams customers will be able to get up-to-the-minute details on what they are being charged.

"That is very helpful. It can help you budget, rather than waiting for a bill to come 30 days later or hear about high usage 10 days after the fact," said Greg Britz, systems integration engineer at Burlington Northern Santa Fe Corp.

Changing bandwidth at will could let customers shift into penny-pinching mode, ratcheting down the size of circuits when demand drops, Britz said. "There could be some significant advantages there. If you want to control the budget, that's very attractive."

All this will be possible because Williams is building its net from scratch, taking advantage of the latest networking gear that supports new services and also reduces the carrier's costs.

Williams was the former owner of Wiltel, a fiber-based network-service company that WorldCom, Inc. bought in 1995. As Williams planned to get back into the business, it considered building a network just like Wiltel's, with a traditional infrastructure that included overlay frame relay and ATM networks.

Ultimately, the firm ruled out that network design. "Most of the traffic on the Wiltel network was voice, and data was becoming the predominant traffic," said Wayne Price, manager of Network Development for Williams.

The growth in data was attributable to the growth in IP traffic, and some in the company said they should build an IP-only network that carried IP packets over a Synchronous Optical Network (SONET) OC-48 infrastructure, Price said. But they ruled the IP-only network out as well.

"There is still a big demand for DS-1 and DS-3 private lines as well as frame relay — and video is coming. IP couldn't support those services. We decided to build our network based on ATM because it was the best technology to provide a multiservice network," Price said.

MORE WITH LESS

Traditional carrier networks use DACS and SONET multiplexers to handle traffic. Williams will use Ascend GX 550 ATM switches, which integrate DACS and SONET muxing capabilities, reducing hardware costs and the number of devices in the net.

Because Williams was starting with a clean slate, it tried to avoid being hamstrung by using gear that could rapidly become obsolete. For example, Williams decided it could do without digital access and cross-connect systems (DACS) because those systems' functions are picked up by ATM switches. DACSes connect customer lines to the appropriate trunks within carrier networks.

Similarly, SONET muxes are being incorporated in those switches. That means fewer boxes to manage and maintain (see graphic).

Eliminating DACSes has other benefits, Price said. Traditionally, carrier network engineers would use DACSes to reroute traffic around failures. "A DACS is not a smart device. It doesn't handle commands very quickly," Price said.

Even with a service restoration plan in place for failures, it would take 10 to 30 minutes to reconfigure a big DACS, while an ATM switch would detect a failure and reroute automatically.

Beyond network simplification, the CX 550 ATM switches Williams is buying from Ascend Communications, Inc. support new service management and billing features customers want.

For example, customers can be given the ability to change the minimum guaranteed bandwidth on a frame relay circuit without Williams intervening. ■

Software.com pushes outsourced e-mail envelope

By Paul McNamara
Santa Clara, Calif.

Software.com, Inc. has rolled out a line of electronic messaging servers for ISPs and telecommunications carriers that could result in a slew of new e-mail outsourcing services for small and mid-size companies.

Software.com's InterMail 4.0 line of high-volume messaging servers includes support for basic Post Office Protocol mail and the more advanced Internet Message Access Protocol 4; service-level agreements; an interface that allows the subscriber company to partition and administer user accounts; and spam controls. Software.com touts its servers as being capable of scaling to anywhere from 250,000 to several million users.

New from Software.com

The company's InterMail 4.0 product lineup includes:

- Five versions of the messaging system for ISPs to use for building outsourced messaging services.
- New Web e-mail capabilities.
- Support for Internet Message Access Protocol 4.
- Features that allow the delegation of administrative responsibilities.
- Support for service-level agreements.

While outsourcing may make a lot of sense for small businesses, large companies will most likely retain control of their e-mail networks, said David Marshak, an analyst with Boston-based Patricia Seybold Group, Inc. Handing e-mail management to an ISP would be "a worrisome proposition" for companies that rely on e-mail for running their operations day to day, he said.

InterMail 4.0 is available immediately on a variety of Unix operating systems, including those from Sun Microsystems, Inc., Digital Equipment Corp. and Silicon Graphics, Inc.

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Get more online:

- **A map of the Williams network**
- **A look at its frame relay offerings**
- **Info on other telecom upstarts**

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WAN MONITOR

The cable guys have the answer

TeleChoice has consultants spread throughout eight states, including many who operate out of home offices as their primary or secondary location. Though we're a relatively small company, we have big company networking challenges with remote access needs high on the list.

The documents we create are often huge and are getting bigger by the software release. It is not productive to have people waiting hours to download big presentations. Managing expectations is also a problem. We deal with leading-edge technologies and services on a daily basis. It makes our people hungry for more than just 56K dial-up access into the network. A recent experience with cable modems at one office left all of our remote offices hungry for more speed.

One TeleChoice director based in a northern suburb of Dallas responded to an ad from @Home advertising that said "The Wait Is Over!" — the company was offering ultrafast access to the Internet using cable modems. For just under $40 per month and a one time installation fee of $150, the standard @Home service includes a constant data connection to the Internet, plus 5M bytes of personal Web space and content. This allowed us to cancel one of our plain old telephone service (POTS) lines ($45.00 per month) and the current online account ($19.95 per month).

Because our people use the network mostly during the day, the available capacity is high and the level of competition for this shared medium, a common criticism of cable modems, is limited. The service allows bursting up to 3M bit/sec. Even the huge presentations vendors send us for their briefings don't bog down the connection at this rate.

Daniel Briere
Christine Heckart

The service was easy and fast to order. In five minutes on the phone, the customer service agent was able to verify availability of the service at the location, provide installation date alternatives and check to ensure that the PC in our office met @Home's minimum requirements.

The local phone companies should steal a page from this book. Most can't provide services such as this for ISDN let alone digital subscriber line (DSL). And what would the lead time be if this were a DSL (or even ISDN) installation from the local telco? It took less than a week to get the cable modem installed from the day of order. The office is in SBC territory, the same SBC that can't get a standard POTS line installed in anything less than a month. If the G.lite, also known as splitterless DSL or DSL lite, xDSL specification gets delayed, incumbent local exchange carriers and competitive local exchange carriers are going to get a real run for their money from the cable guys.

That's because splitterless DSL, which supports speeds of 1.5M bit/sec toward the customer and 384K bit/sec away, can be provisioned quickly and easily without a technician needing to come to your house. Delaying the G.lite standard means the cable companies could end up owning the lucrative and fast-growing remote office and telecommuter markets.

Briere is president and Heckart is vice president with TeleChoice, Inc., a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

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Circle Reader Service #15

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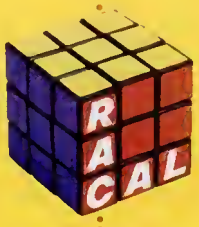
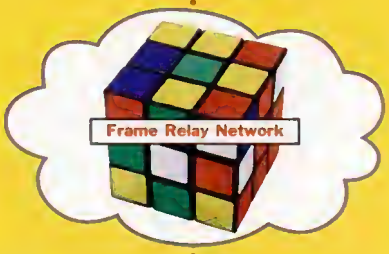


YOUR DATA IS ENCRYPTED WHILE ON THE NETWORK.



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Circle Reader Service #6

Briefs

Novell, Inc. *plans to* **invest $15 million** *in Java and Internet start-ups this year, according to* **CEO Eric Schmidt.** *The money will come from the $50 million Java Development Fund the company started early this year to finance companies developing Java-based Internet applications for Novell's network servers. Schmidt told a group of investors that Novell has conducted due diligence on a number of start-ups and has narrowed the list to about 10 potential fund recipients.*

Novell's Schmidt ready to spend.

Fabrik Communications, Inc. *of San Francisco last week announced Fabrik Remote, an Internet standards-based* **e-mail service** *designed to connect remote and mobile users to their corporate messaging systems. Fabrik Remote allows users of standards-based clients to access e-mail and corporate directories from LAN and client/server systems, including Microsoft Corp.'s Exchange and Microsoft Mail, and Lotus Development Corp.'s Notes and cc:Mail.*

Available immediately, Fabrik remote costs $6.95 per month per mailbox.

✆ Fabrik: (800) 732-2745

Citrix Systems Inc. *of Fort Lauderdale, Fla., said it plans to acquire privately held AMP, Ltd. of Cambridge, England, for $40 million in cash, a move that will enable Citrix to add* **Java capabilities** *to its thin client/server software offerings.*

Digitivity, Inc., *AMP's wholly owned product arm, makes server software that helps companies deploy and manage Java applications across the Internet and intranets.*

In-Site

Military to show e-mail security strength

By Ellen Messmer
Washington, D.C.

The U.S. military this summer will begin a massive revamp of its 3-year-old electronic messaging system to ensure that classified information can be exchanged more securely.

The improved version of the Defense Message System (DMS), which is used by more than 100,000 Air Force, Army and Navy personnel, will feature the latest in digital certificate and message filtering technologies.

DMS has been the subject of intense debate within the military over the years, with many of the arguments focusing on just how secure the messaging system needs to be.

Back in the early '90s, when DMS was on the drawing board, the military decided that each end user would be required to sign and encrypt each X.400 message for security reasons. The DMS software was supplied by Enterprise Solutions, Ltd., Lotus Development Corp. and Microsoft Corp.

Over the past couple of years, the system's overseers loosened up and added Simple Mail Transfer Protocol client software into the mix to simplify more casual e-mail exchanges.

Now the military is shifting back toward a more conservative e-mail strategy. The upgraded edition of DMS will divide users into groups, each of which will have to adhere to different messaging rules.

Dissecting the Defense Message System

What it consists of now:

- X.400 and SMTP software from Enterprise Solutions, Lotus and Microsoft
- Fortezza encryption cards
- X.509v2 digital certificate technology

What's new:

- X.509v3 digital certificate technology
- Message filtering technology from Wang and Secure Computing

"There is going to be a separate DMS infrastructure for unclassified, secret, top-secret collateral and top-secret compartmented information," said David Dick, DMS Air Force national account manager at Lockheed Martin Federal Systems, Inc., which was named the prime contractor for DMS back in 1995.

Good-bye Autodin

Another key reason for making the system more secure is that the military is doing away with Autodin, a 25-year-old secure communication system, by the end of next year.

While the military doesn't share a lot of information with the public about Autodin, it is known that the system generates printouts that must be hand-delivered by trusted personnel to commanding officers. With this old system on the way out, DMS needs to pick up where Autodin leaves off.

The DMS overhaul involves the swapping out of the X.400 software and Fortezza encryption cards to add support for X.509v3 digital certificates. The existing version of DMS supports X.509v2, which is not backward compatible with the newer edition of the digital certificate technology, Dick said.

Users with classified security jobs will be required to encrypt their messages. In addition, some messages will be encrypted twice — both by individual end users and at "bulk encryption" hubs across the network, where batches of messages will be encrypted.

The new DMS also will feature a policy-based filtering mechanism to ensure that end users can't conduct classified communications with unclassified DMS users. Classified communications account for about 15% of the military's network traffic.

The filtering technology, called High-Assurance Guard, was designed by the National Security Agency (NSA) and is being implemented by Wang Global and Secure Computing Corp. in both companies' firewall products.

The Central Intelligence Agency, the NSA and Fort Huachuca, Ariz.'s interoperability test center, have already started installing High-Assurance Guard technology at Internet access points and on LANs at some bases to test the concept of filtering mail for security purposes.

Now being tested, the new DMS is expected to be available to about 200,000 end users this fall and another 200,000 end users next year.

The military initially envisioned DMS being used by a couple million people for everything from administrative use to mobile communication on the battlefield. DMS's expansion is still a hot topic within the military. ■

QUICK TAKE: NOVATION

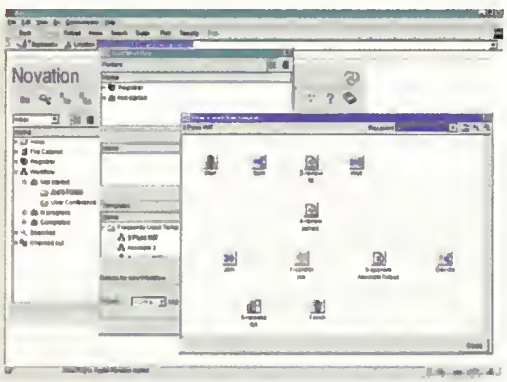
Novasoft puts JavaBeans to work

Novasoft Systems, Inc. of Burlington, Mass., this week will take the wraps off Novation, the company's JavaBeans-based workflow and document management product.

Novasoft officials contend that Novation's reliance on JavaBeans and graphical workflow tools will allow customers to build and change workflow and document management applications more often, easily and rapidly than with traditional client/server products (see graphic). "Novasoft has made an excellent strategic choice by going with the adaptive component architecture," said Anne Thomas, an analyst with Patricia Seybold Group in Boston.

Available immediately, Novation costs between $100 and $800 per seat, depending on the volume ordered.

Novasoft: (781) 221-0300



Get more online:

- A DMS overview
- A look at DMS's security methods and systems

Apache, Microsoft rate well in Web server survey

By Andy Eddy
Bath, England

On the first day of every month, thousands of servers around the world have their identification checked.

The concept behind this endeavor isn't to root out underage servers, but rather to determine what server software is being run and to provide the results to the network community. Netcraft, Ltd., a Bath, England consultancy, has conducted the survey since August 1995.

The monthly process involves going through the Domain Name System to create a list of public Internet sites. The sites on the list are polled — via a script written by Netcraft and transmitted by an HTTP request — about what Web server software they are running.

Obviously, the task has grown considerably. The first tally was based on 18,957 sites, while this month's survey sampled 2,410,067 hosts.

Netcraft's survey looks at market share by vendor and by product. The most recent survey indicated that Apache Project servers and their variations account for approximately 49% of the hosts polled, with Microsoft Corp. servers garnering more than 22% and Netscape Communications Corp. servers having close to 9% (Netcraft found that Netscape Enterprise server was being used at 5% of the sites).

The survey also showed that Apache and Microsoft are gradually gaining share, while the rest of the companies' servers are losing ground in the percentage of sites on which they are employed. Of course, the results are far from scientific and not necessarily representative of total server usage, with certain criteria skewing the results.

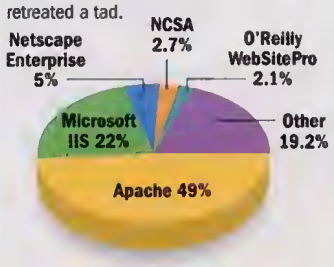
For instance, the survey looks only at servers that can be publicly polled, which excludes private networks. Additionally, Apache supports the serving of multiple domains on one machine, making it attractive to a hosting service such as Hiway Technologies, Inc., which claims to host over 90,000 domains. Mike Prettejohn, Netcraft's director, stated that whichever companies do well with hosting services will likely do well in the survey.

"In Fortune 500 companies, Netscape would be on top. If you look at self-hosted services, Microsoft would probably do best," Prettejohn noted.

Just the same, Prettejohn said that if he were Netscape, he'd be worried. From his viewpoint, while having a share of the business community is important, "the little people add up" and may influence other buying decisions. ■

Surveying the Web server scene

Apache continues to produce the most popular Web server, according to Netcraft's June survey. The numbers for Apache and Microsoft grew a bit from May, while the numbers for Netscape, NCSA and O'Reilly retreated a tad.



Based on survey of 2,410,067 sites.

.WORK THE
WEB.

THe CIO IS iN THE hot seat as the executive committee drills one department head after another on escalating costs. How are you going to [1](get the newly acquired subsidiary onto our e-mail system)? How are you going to [2](hold down your network administration head count) as you add hundreds of new users? How can you afford to [3](roll out new apps to the whole company)? It's like the Spanish Inquisition, but the food is worse. Her stomach rumbles from the dry turkey sandwich and yuppie water served at the start of the meeting as one committee member wakes up long enough to ask about the [4](Year 2000 problem) he saw on a CNN segment. "Not a problem, we have it covered," she replies. With an unforeseen compliment for completing the [5](global supplier extranet) project, she is excused. Exiting, she smiles at the beleaguered marketing director, who is about to be skewered because the company's celebrity pitchman has just appeared on the cover of a major supermarket tabloid.

THE [6](BEST PARTS) OF HER MEETING WERE MADE POSSIBLE BY LOTUS.

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'NET INSIDER

Is Sprint doing it again?

Sprint has not always been the first carrier to market with new services, but a number of times the company has been the first to exploit new technology or marketing ideas.

Ten years ago, Sprint was the first major carrier to advertise an all-fiber phone network, and later the company was the first major carrier to offer distance-insensitive, long-distance pricing. Now Sprint has announced Integrated On-demand Network (ION), which, if it comes to pass, will revolutionize the ISP business and, once again, the phone service business.

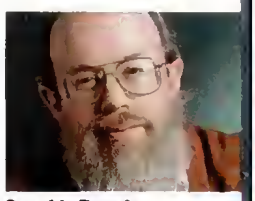
ION is an integrated voice-data service that will involve a wide range of network technologies from wave-division multiplexing and ATM in the backbone to digital subscriber lines in the local loop. ION will permit the simultaneous use of a phone and a Web browser on the same phone line.

Sprint does face some significant challenges on the path to deploying ION. For example, Sprint will have to persuade local phone companies to lease the wire between their offices and their customers, while at the same time getting space in the same offices for Sprint's equipment.

It is far from clear if Sprint actually will be able to make a go of ION, and that may be why the company's well-orchestrated announcement received a tepid reaction from the stock market.

But the most important part of the announcement was not the technology. ION will for the first time move away from the model of charging for voice traffic by the minute.

Instead, Sprint could charge for all communications services by the quantity of data exchanged, not by time or distance. The more data you send, the more you pay. This is what I suggested a few weeks ago as the logical way to charge for services on the Internet.



Scott Bradner

It will not be easy for Sprint to figure out how much to charge for transferring a specific amount of data. It would be very easy to come up with a price that's attractive for voice and fax, and Sprint is predicting a 70% reduction in the cost of long-distance phone calls under ION.

But charging that same rate for Web traffic might produce quite a shock for Web surfers at the end of a month, particularly if they are checking out the latest photo spreads.

Sprint may also face regulatory barriers to any plan to move away from per-minute pricing of voice calls.

For example, how are the regulators going to be able to raise money for the universal service fund under this new pricing model?

And what happens if a call is made to someone served by an old-style phone company, one that still charges by the minute?

Sprint has been able to shake up the often stodgy telephone business before and it is great to see the carrier at it again, even if there may be reasons to question some of the underlying technical and business assumptions.

Disclaimer: We don't do stodgy at Harvard. In any case, the above glee is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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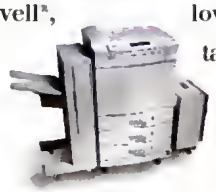

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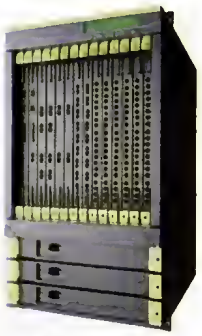

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Circle Reader Service #18

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My company recently merged with another company, and I've been tasked with bringing the networks into one cohesive package. Fortunately, both companies are using Novell, Inc.'s IntranetWare operating system. Will it be easier to merge the two trees together or to reinstall the servers at the other company from scratch?

Via the Internet

Merging two Novell Directory Service (NDS) trees is straightforward once you know what to do. First, make sure both systems are on the same version of DS.NLM (currently at Version 5.95) and install the latest service pack. Then inventory which server software packages, such as NetWare Connect and NetWare for SAA, may have extended the directory services schema (the structural layout of the NDS database). You may need to install, but not configure, the applications so the schema on both networks is identical.

Look at the layout of the organization and organizational units to see if you will need to rename or reorganize the container objects prior to merging. Using DSREPAIR.NLM, perform an unattended repair and a structural rebuild on both servers. Repeat this process until you get at least one pass on both operations without any reported errors. At the command prompt, type SET DSTRACE = ALL and watch for an ALL PROCESSED = YES message to appear on the servers that will be merging. This will be a good indication that all is well and you will be able to proceed with the merge operation.

The amount of time it will take for merging will depend on the number of objects in the containers on both systems. This type of operation is best done over a weekend to allow plenty of time for things to complete.

New tagging technique boosts IP QoS

By Jeremy Greene

Applications such as Web browsing and e-mail have been working well with the best-effort quality of service (QoS) provided by the Internet. However, with best-effort services, data can easily be lost or delayed.

An emerging array of high-bandwidth and delay-sensitive applications, such as voice over IP, video over IP and virtual private networks, have become a strong motivating force for the development of improved Internet QoS levels.

A new technology making its way through the Internet Engineering Task Force (IETF), known as Differentiated Services (Diff-Serv), could give users higher levels of Internet QoS.

Diff-Serv is a very simple technology that allows large corporate IP backbone users and ISPs to quickly deploy different QoS levels in the Internet backbone.

Previous attempts to improve Internet QoS included Resource Reservation Protocol (RSVP), also developed by the IETF. RSVP is based on a sophisticated per-connection signaling system that requires routers in the network to "agree" to a specific level of service. Unfortunately, it is widely acknowledged that RSVP is complex to deploy and does not scale well.

Diff-Serv does not specify a signaling system like RSVP, but rather a method to mark, or tag, packets, allowing routers to modify their forwarding behavior appropriately. Various types of traffic requiring different QoS have different tags applied. In place of complex dynamic signaling, ISPs could offer various service-level agreements (SLA) based on Diff-Serv packet markings.

Diff-Serv has a built-in aggregation mechanism: all traffic with the same tag is treated in the same way; each voice connection is not handled separately. This is an important reason why Diff-Serv can scale to support larger environments.

David Clark, senior research scientist at the MIT Laboratory for Computer Science, initially led the effort, producing a first Internet draft on differentiated services in the middle of last year.

The draft proposed partial redefinition of the type-of-service (ToS) byte in the IP packet header to implement Diff-Serv markings.

Reusing an existing IP header field was a significant step in creating a simple standard, since the basic IP protocol would not change.

Further, the draft proposed essentially three marking options: "none," "assured and in profile" and "assured and out of profile." "None" offered existing best-effort service. The definitions of "assured and in profile " and "assure and out of profile" would be described in an SLA between the customer and network service provider.

In late February, the IETF formed the Diff-Serv working group that recently produced an architecture draft (draft-ietf-diffserv-arch-00.txt).

According to this draft, a router's forwarding process modified by a Diff-Serv marking is known as a Per-Hop-Behavior (PHB). A PHB can be defined to just specify minimum bandwidth. A significant effort of the Diff-Serv working group was to determine to what initial standard PHBs should adhere.

Two PHBs are proposed: default and expedited.

Default PHB is defined as today's best-effort service. Expedited PHB is the other extreme: low absolute delay, low delay variation and low packet loss.

The draft further defines Diff-Serv implementation in two types of routers: traffic conditioners and DS-capable. Traffic conditioners perform sophisticated traffic classification, monitoring, shaping, scheduling and marking. They are most likely to be access routers.

DS-capable routers have scheduling capabilities and must modify their forwarding behavior based on the markings. They are most likely to be backbone routers.

This separation of function is another reason for Diff-Serv's simplicity: most of the complexity is in the traffic conditioner, which is at the edge of the network. At the same time, DS-capable routers in the core need only support modified forwarding operations.

A basic requirement for traffic conditioners is to allow an ISP, and potentially ISP customers, to mark packets based on an agreed SLA. The SLA may include limits the traffic conditioner must adhere to, or soft limits that when exceeded cause packets to be marked with a different PHB.

It is likely that ISPs will typically offer a limited number of service levels on their DS-capable backbones.

Traffic conditioners at the edge of the network that support richer classification and scheduling schemes, such as class-based queuing, will provide the flexibility to build an extensible set of SLAs on top of the basic Diff-Serv building blocks.

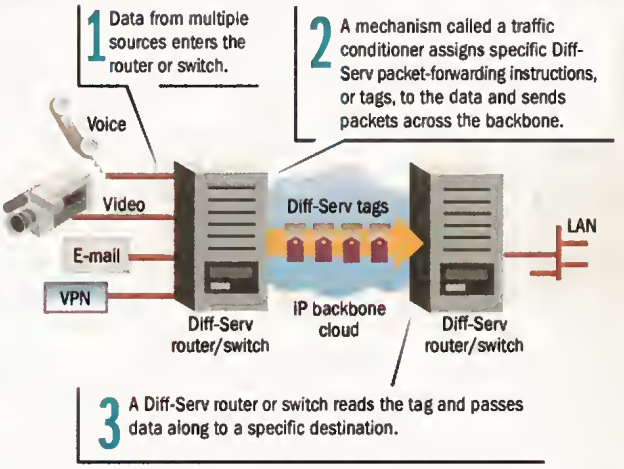
While it may take some time to determine the success of Diff-Serv, its simplicity, flexibility and initial wide acceptance in the user, vendor and ISP communities could finally make end-to-end Internet QoS a reality.

Greene is chief technology officer and vice president of software with Xedia Corp., an Internet access software developer in Littleton, Mass. He can be reached at (978) 952-6000.

HOW IT WORKS

Differentiated Services

The IETF is working on a new IP QoS technique, Differentiated Services (Diff-Serv). Diff-Serv is a signaling mechanism that tags or identifies packets for special treatment as they traverse the backbone. The idea behind Diff-Serv is to guarantee service levels and delivery of data across an IP net.



EDITORIAL *insights*

Can a specialist survive in Dr. Microsoft's world?

If you work for Novell or you sell some variant of Unix, the numbers in the new Network World 500 study are frightening. Among the 500 corporations that responded, each with annual network spending of at least $5 million, Windows NT is already the most widely used server operating system. Of the respondents, 38% have NT, compared with 33% for NetWare and 25% for Unix.

But it's what the future holds that is really sobering for Novell and the Unix vendors. When asked which operating systems will be deployed on servers in the next 12 months, 47% of the *Network World* readers said NT vs. 28% for NetWare and 22% for Unix. More than 40% of readers said they plan to replace NetWare servers with NT in the next year. Unix fared better here, with 25% of network managers saying they plan to replace the venerable operating system.

Is NT doing so well because it is finally an enterprise-class product? No. Readers rate Unix dramatically higher in performance, reliability and scalability — just what the Unix vendors will tell you. Novell outshines Microsoft in directory services.

But neither Unix nor NetWare can hold a candle to NT when it comes to ease of use and value. For most buyers, NT is powerful enough, scalable enough and familiar enough.

Novell and the Unix vendors are banking on the theory that there will always be a set of customers willing to go with NetWare, for some edge in networking services, or Unix, for mission critical applications. In short, customers will need specialists for their high-end needs. That strategy was outlined by Novell CEO Eric Schmidt in a March interview: "In most markets, there are specialists who do things much better than the general-purpose suppliers. We are the specialists and we're going to become even better at being special. NT 5.0 has 32 million lines of code. That creates a perpetual opportunity for Novell to find highly specialized things and do them all well."

You know, I last heard that from the TCP/IP vendors who thought their specialized expertise would spare them the ravages of Microsoft's predation. We all know what happened to them.

NT is getting better and more reliable. It will have a real directory some day. Will it ever be more powerful than Unix at the very high end of the applications scale? Maybe in five years, maybe never. But how many customers will care by then? Will Novell always offer some networking features NT doesn't? It better — and they'd better be good, because it's clear from these numbers that the specialty market is dwindling fast. The big general practitioner, Dr. Microsoft, is definitely making house calls.

John Gallant, editor in chief jgallant@nww.com

The digital economy • Ron Higgins

Backhauling limits the Internet's global reach

The Department of Commerce's study "The Emerging Digital Economy," published in April, points to a brave new world of electronic commerce. The big question is: Can the public Internet handle it? The answer: No way.

The reason? The Internet may be global, but it is U.S.-centric. The Internet infrastructure with which corporate users struggle today is a best-effort attempt to upgrade an Industrial Age network for the digital economy. In short, the public Internet infrastructure is functionally not global in terms of robust access and dependability.

Because of the Internet's Cold War-era, U.S.-centric architecture, nearly all of the world's public Internet traffic must pass through the U.S. infrastructure, in particular through four network access points (NAP) that act as bottlenecks. The process of passing through these NAPs is known as backhauling. Worse, the telecommunications lines over which Internet traffic is backhauled may be oversubscribed by up to 600%.

The roots of backhauling can be traced to the origins of the Internet, which was funded in the late 1960s by the Department of Defense. In the late 1980s, the National Science Foundation outsourced the NAPs to the telecommunications industry as a means of relieving regional network congestion. Those were simpler times, when a U.S.-centric meshed architecture and formal transit peering agreements were adequate for text files transmitted between dumb terminals.

Rather than backhauling, the Internet needs an infrastructure that provides superior connectivity to locations worldwide. Examples of enormous revenue projections abound for a global digital economy that demands sound Internet connectivity.

For instance, Forrester Research predicts that business-to-business Internet commerce will reach $327 billion by 2002. Investment banking firm Piper Jaffray projects that online trading will yield $2.2 billion in commissions by 2001. Market researcher Killen & Associates sees Internet telephony generating $106 billion by 2002. And a Deloitte & Touche survey of corporate executives from more than 400 large U.S. companies reveals that 91% predict the Internet will be their primary news source by 2005.

But in a global digital economy, the performance constraints of a U.S.-centric architecture are bound to limit the number of potential online transactions in international markets.

In Septemher 1997, NUA, Ltd., a Dublin-based Internet consultancy, published the results of a landmark study that tallied the number of Internet users worldwide: 89 million people. The overwhelming majority — some 54 million — is in North America. Europe followed with 18 million, and Asia/Pacific Rim had 14 million. In addition, the Department of Commerce's digital economy report estimates that one billion people worldwide will use the Internet by the year 2005, up from 100 million in 1998.

Without a functional global reach, how can the public Internet support such forecasts?

Like it or not, we must confront the limitations of the U.S.-centric Internet. Some innovators have already taken the reins. Fiber funding, which was once the province of telcos, is rapidly shifting to privately funded entrepreneurs. Architecturally, the U.S.-centric meshed model is being displaced by global alternatives, such as a distributed star that treats the U.S. like any other client on the network.

Backhauling is one form of fallout from a U.S.-centric architecture. Today's attempts to upgrade the public Internet do not address the core problem: The Internet is an Industrial Age solution to an Information Age problem. The digital economy demands an Information Age solution.

Higgins is founder and CEO of Digital Island, Inc., a global IP applications network based in Honolulu. He can be reached at (808) 540-4000 or ron@digisle.net.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification

To market, to market

Regarding Linda Musthaler's column "Dear Novell: Beef up your marketing" (June 1, page 51):

I've been saying this since Eric Schmidt took over — why isn't Novell marketing? Technically, Novell has it all over NT. They just need to get the word out to the people who control the IT budgets. And they need to do it now, while the pre-NT 5.0 marketing window is still open.

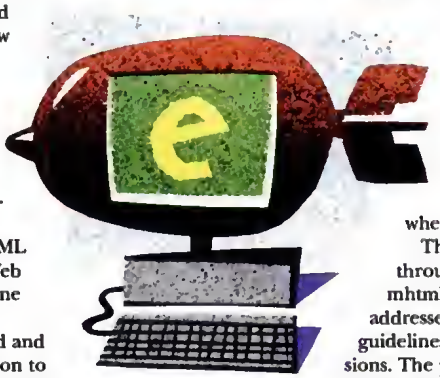
Lance Groth
Director of IT
Minnesota Office of the Legislative Auditor

Mail-based push standard could harm nets

Push technology has come back with a vengeance, and it's got your corporate intranet in its information-choked crosshairs.

Push browsing was all the rage two years ago but fell into disfavor for many reasons, most notably its insatiable appetite for network bandwidth and desktop disk space. Since then, push applications have migrated from specialized desktop environments, such as PointCast and Castanet, toward multipurpose software that almost everyone uses, such as Web browsers and e-mail clients.

In fact, even browser-based push technologies such as Netscape's Netcaster and Microsoft's Active Channels are being ignored in favor of e-mail-based solutions. E-mail has been push oriented from the get-go, and users have flocked to it for the new generation of HTML/mail-oriented push services, such as Netscape's In-Box Direct and Microsoft's Hotmail. Browsers, by contrast, started as pull-oriented applications and are still regarded as such by many users.



The next evolutionary step for HTML/mail-based push technology will come with the Internet Engineering Task Force's imminent ratification of a standard with an ungainly name: MIME Encapsulation of Aggregate Documents, such as HTML (MHTML). MHTML defines a format for tagging all content elements on a Web site or Web page — including all HTML documents, inline graphics, scripts, components and hyperlinks — into e-mail file attachments, which could then be reassembled and browsed offline. MHTML will allow Web-based information to be pushed to people who lack interactive Web access or simply are tired of browsing and saving Web pages one by one.

We should regard MHTML as an atom bomb of sorts: a standard capable of elevating push technology to superpower status in corporate networks or laying waste to well-tended corporate backbones and firewalls. Before we start pushing whole Web sites to users over e-mail links, we should first ask ourselves some serious questions:

- Why does the world need redundant MHTML copies of your Web site or my Web site on thousands or millions of desktops when that data is more efficiently tended on a single, universally available site?
- Wouldn't IP Multicast be a more appropriate delivery medium than e-mail for bulk delivery of megabit-heavy files?
- What role, if any, will proxy servers play when clients prefer to cache most Web pages locally, in the form of MHTML file attachments?
- What mechanisms, if any, will allow MHTML file attachments to be updated incrementally, rather than monolithically, across myriad desktops?
- Do today's corporate firewalls have the processing power needed to efficiently virus-check every attachment on every MHTML-bearing message?
- Do today's mail systems have the processing power and disk space needed to manage the potential deluge of MHTML traffic?
- Have any security mechanisms been identified for preventing users' intranet IP addresses from being revealed to parties outside the firewall when they click on hyperlinks contained in files wrapped up into mail-delivered MHTML packages?
- Has any congestion control mechanism been defined that would, for example, allow users and/ or developers to specify delivery options that are less bit heavy than full MHTML download? Such mechanisms might include options such as "only send the HTTP hyperlinks, I'll browse the source at my convenience" or "only send HTML templates, I'll download the source content automatically when I open the message."

These concerns are not academic. Furthermore, if you read through the draft MHTML standard at www.ietf.org/ids.by.wg/mhtml.html, you'll see that MHTML's developers have not addressed these issues in the standard or in the implementation guidelines. Now is the time to take part in the preratification discussions. The principal MHTML developers are Jacob Palme at Stockholm University (jpalme@dsv.su.se), Alex Hopman at Microsoft (alexhop@microsoft.com) and Nick Shelness at Lotus (shelness@lotus.com). Send them your thoughts and concerns regarding MHTML.

Make no mistake about it. MHTML is coming — Microsoft, Lotus, Netscape, Qualcomm and other major browser and e-mail vendors already are implementing it into their products. Application developers and end users naturally will start to use MHTML features as soon as they are available. If implemented "straight up," MHTML could prove harmful to your network.

Kobielus, a contributing editor to Network World, *is a senior telecommunications analyst with LCC International, Inc., a McLean, Va.-based network design, engineering and integration firm. He can be reached at (703) 873-2474 or kobielus_james@lcc.com. The opinions expressed are his own.*

MARTY BRAUN

St. Paul, Minn.

I would like to be counted as one who would choose NT over NetWare any day of the week.

As both a Certified Novell Engineer and a Microsoft Certified Software Engineer, I have worked with both network operating systems. I was a CNE for four years before I worked with NT, and I immediately became an NT convert.

NT takes hours to set up, as opposed to the days it used to take to set up NetWare. The domain/peer model Microsoft uses is 10 times more flexible that the dedicated server model in NetWare. I also like the fact that NT has built-in TCP/IP and is very easy to set up. Until recently, Novell had IPX/SPX as a default protocol, although this has changed in later versions. An administrator had to jump through several hoops to set up IP over a NetWare network.

NetWare is a crummy application server. I used to run Oracle as a NetWare Loadable Module on NetWare 3.12 and performance was lousy. Now I run SQL Server on an Alpha 4100 using NT. What a difference. It's cost effective and stable, too. In addition, Novell abandoned its NetWare 3.12 CNEs. Instead of offering us some sort of upgrade certification, Novell made us retake all the 4.X tests. Talk about a stupid marketing move.

I am no Microsoft fan. I don't like a lot of Microsoft's business practices. However, Microsoft makes a good product. Most of those forum respondents Musthaler cites must hate change. There's a word for folks like that: cadavers.

G. P. King
Manager of information services
Flintlock, Ltd.
Houston

I totally agree with Linda Musthaler that Novell needs to improve its marketing. I have some suggestions for this much-needed marketing effort.

If Novell were to present NetWare's strengths as they affect the bottom line, management might listen. In a new "Dare to Compare," Novell could show how much quicker and simpler it is to administer users under Novell Directory Service (NDS) than NT 4.0. For example, how much time does a network administrator save by using NDS to add 30 users to a new group? Or what are the cost savings from using NetWare's more efficient coding?

Novell could set the record straight on how Novell outperforms NT in file services in situations involving large numbers of users — a fact left out of most NT advertising. Novell could describe horror stories in which companies thought they could save money by installing NT, only to find that the actual cost was five times what was predicted. After an experience like that, it is too costly to undo the work. Novell also has a larger base of qualified and certified professionals. Finally, Novell has a better record of delivering an operational product on time.

Ron Russak
Austin, Texas

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Letters about Novell and marketing

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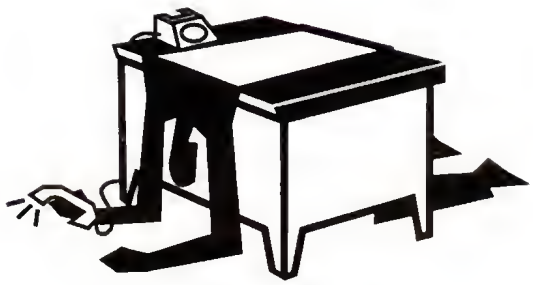

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[Introducing Z.E.N.works™ from Novell®.]

Z.E.N.works allows the IS department to manage applicotions and upgrades from o single location.
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Bulletproofing NT

SAM WARD

A new crop of tools provides server and NIC redundancy, ensuring high availability for your NT servers.

By Charles Bruno and Greg Kilmartin

Thirty seconds is just a blip in a lifetime, but for many network managers it is also an annual downtime ceiling that, if exceeded, could unravel their careers.

Network downtime costs domestic businesses $4 billion annually, according to various estimates. On average, a single network outage in the retail industry costs $140,000, while in the securities sector the figure is $450,000.

That's why as Microsoft Corp.'s Windows NT Server increases in popularity, a cottage industry is springing up to deliver hardware and software aimed at improving the fault tolerance and availability of NT servers, whether they're used for traditional applications or as Web servers.

Many of the products address one of two key issues: server clustering, which is intended to guarantee server availability, even when a mission-critical system or application collapses; and preservation of the server's network connection, even in the face of network adapter, link or switch failures.

For the purposes of this article, The Tolly Group chose two products to represent each type of offering and put them through their paces in the lab. In the server clustering category, we examined the long-awaited Microsoft Cluster Server (MSCS), formerly known as Wolfpack, and Bright Tiger Technologies' ClusterCATS, a powerful offering that focuses on NT-based Web servers. We focused on MSCS because it is the only clustering software integrated within the server operating system. We examined ClusterCATS because it represents a new class of software that brings clustering to NT-based Web servers.

For providing fault tolerance at the network interface card (NIC) level, we explored two of the most innovative offerings — Adaptec, Inc.'s Duo ANA-6922A PCI and Intel Corp.'s EtherExpress PRO/100. While we found both work as advertised, we also uncovered some important limitations in terms of the network configurations in which you can deploy them.

Wolfpack attack

Microsoft recently delivered MSCS, nearly three years after the company first started talking it up, back in October 1995. Integrated as a service within NT Server 4.0 Enterprise Edition, MSCS allows two servers to work together as a single logical system, sharing a disk array subsystem and acting as hot standbys for each other.

Hardware compatibility with MSCS is limited, so don't think you can slap any two servers together and run MSCS on top (see story, page 48).

With MSCS, NT Servers "adopt" various resources, which can be any physical or logical entity that provides a service to clients, such as a SCSI-attached disk, a set of applications or file shares. When a server fails, MSCS transfers its resources to a hot standby server.

For the evaluation, we configured a pair of Data General Corp. AViiON 200-MHz Pentium Pros as Web servers running a real-time simulated stockbroker transaction application. Each server had 64M bytes of memory, 2.1G bytes of local storage and 1.9G bytes of external shared disk storage. The servers ran Windows NT Server 4.0 Enterprise Edition (Service Pack 3), Microsoft Message Queue (MSMQ) and Internet Information Server (IIS) 3.0.

The servers were linked to a 3Com Corp. SuperStack II Switch 3300 Fast Ethernet switch, which also supported a connection to a downstream client workstation, used to enter trading orders. A SCSI cable linked both servers to a shared disk array.

To test the failover capability, we powered off Server A. It took 16 seconds for MSCS on Server B to realize its partner had disappeared. One reason it took so long is that, by default, we had the backup server configured to kick in after the third attempt at polling the downed server. You can fine-tune MSCS software so the backup server steps in sooner, if necessary.

After Server B realized its cluster partner had vanished, it took 76 seconds for the applications and processes running on Server A to failover to Server B. Microsoft says a failed server usually recovers in about 30 seconds. MSCS required more than double that time in The Tolly Group tests because failover time is largely dependent on the applications and server processes running on your cluster.

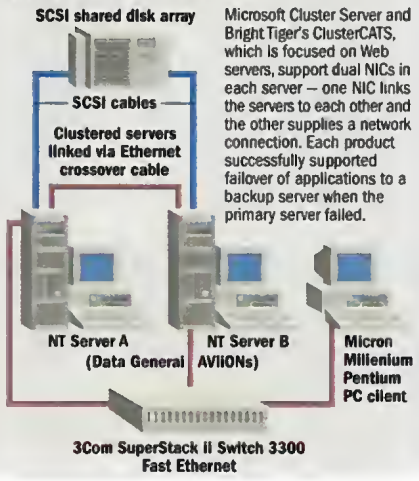
In our tests, the server cluster was configured as a strategic business server, supporting more than a dozen applications and other resources. As the primary server failed, each of these resources had to be restarted on the backup server. Users were thus left without access to certain applications, databases and files for a total of more than 90 seconds. You'll have to determine how long your users can stand to be without access to each application as you decide which resources your various servers will support.

In addition to its failover capabilities, MSCS can redistribute a group of resources to a primary, or preferred, server once it has been restarted. You can define a clustered server as the preferred server to support a specific group of resources, including applications, disks and file shares.

The Tolly Group defined Server B in its cluster as a preferred server, giving it rights to support a file share group. With those file share resources running on the server, we powered off Server B; MSCS failed over the file share group to Server A. We then powered up Server B, logged on to the NT domain, and the file share group failed back to Server B.

MSCS also works with MSMQ software, previ-

SERVER CLUSTER TESTBED



Microsoft Cluster Server and Bright Tiger's ClusterCATS, which is focused on Web servers, support dual NICs in each server — one NIC links the servers to each other and the other supplies a network connection. Each product successfully supported failover of applications to a backup server when the primary server failed.

NT SERVER CLUSTERING PRODUCTS

Vendor/Product	Key features
Atreve Software, Inc. WebSpective 1.5	Examines Web server behavior and reroutes Web users from overtaxed servers with poor performance. Provides Web server failover and recovery services.
Bright Tiger Technologies ClusterCATS	Delivers Web server clustering, failover and content-management services.
Digital Equipment Corp. Clusters for Windows NT	Allows a pair of active Digital servers running Windows NT to be managed and accessed as a single system.
Microsoft Corp. Microsoft Cluster Server	Integrates dual-server clustering into NT Server Enterprise Edition operating system.
NCR Corp. LifeKeeper for Windows NT 2.0	Offers server clustering for up to 16 NT Server nodes; N-way Fail-over feature lets any cluster node act as a standby.
Stratus Computer, Inc. RADIO Cluster	Interconnects as many as eight network, storage and application servers into a single cluster.
Qualix Group, Inc. OctopusHA+ for Windows NT	Centralizes management of multiple clusters via a Java-based graphical user interface with dynamic reconfiguration, minimizing application downtime.
Vinca Corp. Co-StandbyServer	Allows either of two NT Servers to failover to the other; services can transfer back once a server reboots.

SOURCE: THE TOLLY GROUP, MANASQUAN, N.J.

ously code-named Falcon. When real-time applications are running on clustered servers, MSMQ software is deployed on the servers and attached client workstations. If a server running a real-time application fails, MSMQ running on the client detects the loss of service and builds a local message queue listing transactions yet to be performed. Once failover is complete, the client software ships the queued transactions to the new server.

One slick feature of MSCS is the capability for users to link clustered resources to an NT Registry key, which stores information about what the resource was doing before it crashed. In the event of a failover, the backup server picking up those resources looks in the Registry key and learns what the application, disk device or other resource was doing so it can restore service to that state.

A downside is that MSCS does not support Dynamic Host Configuration Protocol (DHCP) servers as a resource type. Only static IP addresses or IP addresses permanently secured from a DHCP server are supported.

One cool ClusterCATS

While MSCS provides innovative clustering for NT Server Enterprise Edition, Bright Tiger brings a different brand of clustering to NT-based Web servers with its ClusterCATS (Content, Applications and Transaction Smart) software.

ClusterCATS enables you to build and manage SmartClusters, or groups of servers, applications, databases and other resources that span one or more locations. ClusterCATS performs many duties, but its chief function is to provide server load management and failover capabilities. Moreover, the software enables you to easily, and often automatically, replicate entire Web servers or specific Web server content.

To test its failover capabilities, we first set up two NT-based Web servers and replicated content across both. The Web servers were attached to a Fast Ethernet network with Internet Explorer browser clients. The environment simulated an intranet, although the software is designed to work just as well across the Internet.

With ClusterCATS operating on two Web servers, we took one of the devices out of service for maintenance. Consequently, ClusterCATS redirected all HTTP requests to the backup server. The only clue that the client browser had shifted to an alternative Web server was the backup server's URL displayed onscreen.

We used a simulated order-processing application to see how ClusterCATS would failover transactions in mid-stream. Typically, when a Web server crashes, users lose their sessions and cannot reconnect. With ClusterCATS, a backup server will redirect users to a Web page that informs them of the loss of transaction data and instructs them to reenter order data. In another scenario, if you want to take a Web server down for maintenance or other reasons, ClusterCATS will cache session variables — such as user name, credit card number and order entries — and ensure that all transactions in progress are completed before the server comes down.

ClusterCATS also supports failover of Oracle Corp. and SQL databases that reside on NT-based Web sites. Bright Tiger plans to offer support for Open Database Connectivity-compliant databases in the near future.

Using ClusterCATS Monitor Agent, you can configure a probe that monitors an entire database or select tables. In the event the probe detects a loss of database service, it redirects queries to a replicated database on an alternate Web server.

In the evaluation, an SQL database was queried for product data and to create orders. We began browsing products in the database on Web Server 1, then failed the SQL database on that Web server. The transaction continued uninterrupted as queries shifted to Web Server 2.

On top of its failover capabilities, ClusterCATS manages content versions; it will redirect users' requests for data to the Web server containing the most current data.

ClusterCATS also handles load balancing among Web servers. Administrators can set two thresholds: a minimum setting that enables a Web server to redirect a percentage of queries as it becomes increasingly busy, and a maximum threshold that offloads all queries once a server reaches the limit.

In our tests, we lowered the maximum threshold to 10% of the Web server, meaning that when the Web server hit 10% of its processing capacity, it directed all other HTTP requests to an alternate Web server. During testing, the Web client transferred HTTP requests to another server without a hitch.

Adapter fault tolerance

While clustering software can help you survive server failures, for added fault tolerance you also need to protect the server's connection to the network.

Companies such as 3Com, Intel, Adaptec and ZNYX Corp. now offer adapters that support redundant Fast Ethernet links, or connections that support Cisco Systems, Inc.'s proprietary Fast EtherChannel. Traditionally, resilient server connections have supported only dual-homed FDDI links.

In addition to providing link and port redundancy, many of these vendors are now offering features such as load balancing and port aggregation, which increase bandwidth between a server and its switch.

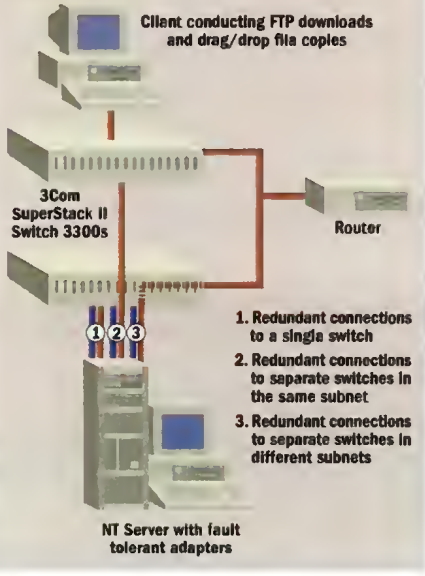
The products we examined — Adaptec's Duo ANA-6922A PCI and Intel's EtherExpress PRO/100 server adapters — represent different design schools.

Adaptec's Duo ANA-6922A represents a design approach shared by ZNYX, 3Com and others to populate multiple Fast Ethernet ports (up to four for Adaptec) on a single card that fills one PCI slot, enabling you to preserve valuable server slots. The idea is that the benefit of the increased port density per card outweighs the potential risk of a single card crashing, which would knock out the redundant links supported by that card.

Intel, on the other hand, only supports one

FAULT TOLERANT ADAPTER TESTBED

For the tests, the NT Server machine was outfitted with a pair of Intel EtherExpress PRO/100 single-port NICs or a dual-port Adaptec Duo ANA-6922A NIC. The server was linked to the network in three configurations, as shown. In the first two scenarios, when Link 1 failed, its IP address successfully rolled over to Link 2. Under the third scenario, the failover did not occur, showing the software could not deal with switches in different subnets.



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active Fast Ethernet link per board, meaning it takes two server slots to nail up redundant server links. Intel emphasizes the need for component redundancy; if one board fails, the backup server connection stays intact because it resides on a physically separate board.

In our view, Intel's EtherExpress PRO/100 has a better fault-tolerant design because it removes the possibility of one adapter or PCI bus slot becoming a single point of failure, rare as such an event may be.

We tested the Adaptec and Intel adapters in a variety of scenarios. Our aim was to evaluate how the adapters failed over to a backup link after a port, link or switch outage.

In the first scenario, we plugged the Adaptec NIC into a 133-MHz Pentium-based Micron Millennia server with 64M bytes of memory and 1.2G bytes of storage. The server ran Windows NT 4.0 Server (Service Pack 3) and IIS 3.0. We nailed up two Fast Ethernet connections from the Adaptec NIC to a 3Com SuperStack II Switch 3300. A PC client also connected to the switch.

Get more online:

We've established links to vendor Web sites where you can learn more about the clustering and network interface products mentioned in this story. Wherever possible, we bring you right to the appropriate page to save you time.

www.nwfusion.com

After initiating a File Transfer Protocol download of a 300M-byte file from the server to the client, we disconnected the primary Fast Ethernet link and verified that the secondary link kicked in. Failover occurred within three seconds. We then conducted a drag-and-drop file copy from the server to the client and failed the primary port again. Once complete, we used NT's "comp" command to compare file sizes and ensure the transfer occurred without a hiccup; a Wandel & Goltermann, Inc. DA-30C internetwork analyzer confirmed all frames were transmitted and compared them against previous tests conducted without port failure.

We repeated the same process using dual Intel EtherExpress adapters, pulling the primary card to determine if the hot backup would step in. Failover occurred within four to six seconds for the Intel EtherExpress.

Connecting redundant server links to a single switch works well for the server adapters tested, but it leaves something to be desired in terms of fault tolerant design. A better approach would be to connect each server link to a different switch so if one switch crashes, it doesn't bring down the primary and backup server links with it.

In this test, the Adaptec Duo ANA-6922A server adapters failed over to backup links within three seconds, and the Intel EtherExpress PRO/100 failed over within an average of four seconds. The tests prove servers can communicate Layer 2 switched traffic over their redundant links without service interruption.

Both server adapters, however, ran into trouble with their redundant links when we connected them to physically separate switches that pass traffic through an intermediate router. The upshot is you cannot set up redundant server connections to separate switches if the switches reside in different subnets.

During testing under this scenario, neither product cut over to a backup link when the primary link failed. That's because adapter vendors typically broadcast discovery packets onto the network to ensure the primary link is intact. However, such broadcast traffic is screened by a router and is not passed between subnetworks.

FAULT TOLERANT NT SERVER ADAPTERS

Company/product	Key features
3Com Corp. Fast EtherLink server NIC	Uses 3Com's Self-Healing Drivers to continuously monitor the network server link and failover to a second port if necessary.
Adaptec, Inc. ANA-6911A, 6922A, 6944A	One-, two- and four-port cards provide port or line failover; load balancing is supported with the addition of Duralink Port Aggregation software.
Intel Corp. EtherExpress PRO/100 server adapter	Supports link failover; adapter supports one active link at a time.
LANart Corp. 10+100 Fiber NIC	Fails over a single 100M port to a 10M bit/sec port.
ZNYX Corp. RAINcluster	Provides link failover with support for Cisco's Fast EtherChannel, so servers can use four full-duplex, load-balanced connections to a Cisco switch.

SOURCE: THE TOLLY GROUP, MANASQUAN, N.J.

Lessons learned

All four NT fault tolerant products tested impressed our engineers.

On the server clustering front, Bright Tiger's ClusterCATS is providing a level of fault tolerance suitable for high-performance electronic commerce servers. The software is especially powerful in maintaining availability of Web-based order-entry and transaction-processing applications. In fact, its array of fault tolerant services should make it a requisite for business-class Web-based servers.

Microsoft, meanwhile, seems to have a winner with MSCS. The software provides the necessary failover services to enable a hot standby server to step into the breech in the event a primary server crashes. But our experience shows MSCS will require a fair amount of user fine-tuning to shrink failover times to acceptable levels.

On the fault tolerant adapter side, Adaptec, with its Duo ANA-6922A PCI, certainly will offer the more attractive price performance because it packs more fault tolerant ports per card than Intel's offering. If you can live with the fact that Adaptec's design is based on the belief that its NIC won't fail, the Duo ANA-6922A will emerge as an attractive choice. Intel's EtherExpress PRO/100, however, is the preferred choice for users looking for maximum fault tolerance.

The big picture, though, is that all these tools are delivering the type of high-availability services required to make NT Server capable of supporting mission-critical applications.

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Complex decisions on clustering hardware

When you deploy MSCS, be prepared to make some hardware choices, and don't be surprised if the software doesn't run on your favorite Pentium server platform.

As of press time, Microsoft Corp. says MSCS is compatible with 209 server-disk subsystem configurations from 16 vendors. However, the majority of the configurations use machines from two vendors — Compaq Computer Corp. and Digital Equipment Corp. (Visit Microsoft's Hardware Compatibility List at www.microsoft.com/hwtest/hcl to learn more about available server choices for MSCS.)

While the majority of servers available for MSCS are Pentium-class machines, Windows NT Server Enterprise Edition (which includes MSCS) can also run on Alpha servers from Digital.

And you don't have to deploy identical servers to form your two-node cluster; you can mix and match different brand servers and disk subsystems. It's even possible for MSCS to run on existing servers in your network, provided the devices are listed on the approved Hardware Compatibility List that Microsoft maintains.

You also have to consider the number of processors you intend to run in your two-node MSCS cluster. Windows NT Server Enterprise Edition is architected to support up to 32 processors per server, hence a maximum of 64 processors per cluster. However, at present, a maximum of 20 processors is supported by MSCS-approved hardware, meaning the largest available server supports 10 processors. Note that MSCS does not require both servers in a cluster to contain the same number of processors.

Lastly, each server needs at least 64M bytes of RAM, 500M bytes of available disk storage, a CD-ROM drive and two NICs: One attaches the cluster to the outside network, while the other links the two servers.

— *Charles Bruno*

FEATURE

A day in the life of a spammer

Continued from page 1

"It's been a constant fight," says Hardigree, clad in a black polo shirt, a gold chain, white tennis shorts, white socks and white Nikes — typical attire, so long as no client meetings are scheduled. "We feel like we're a good service and we're playing by the rules, but no matter how fine a line you try to walk, there are people who still can't stand that we're on this earth."

ISPs report that spam amounts to anywhere between 5% and 30% of their e-mail volume. They spend millions of dollars per month employing people to fight spam and providing additional bandwidth to carry it. One estimate is that spam-related expenses constitute about $2 of a consumer's monthly ISP bill. On a more personal level, Scott Hazen Mueller, chairman of the Coalition Against Unsolicited Commercial E-Mail, estimates he receives 100 messages per day, of which between 10% and 30% are spam.

Taking e-mail to the next level

Hardigree staunchly maintains what he's doing is not spam because his e-mails are targeted to the individual recipient, and he argues that he pays for the bandwidth he uses. He describes himself as a hard-working, ethical entrepreneur who has built his business from a one-man show based in his house to a five-person operation that expects to take in between $750,000 and $1 million in 1998. And he has grand expansion plans.

But for now, Internet Media Group, Inc., is still very much a start-up. Behind an unmarked door in a generic office suite here, the company shares no-frills space and secretarial resources with another tenant. Hardigree even shares his corner office with a sales rep, while his technical staff is crammed in to a second room.

Sitting behind a black desk, with palm trees swaying outside the room's picture windows, Hardigree says his goal is to bring respectability to unsolicited e-mail. "We'd like to be the company that takes e-mail to the next level," he says.

While the Internet's most notorious spammer, Sanford Wallace of Cyber Promotions, Inc., and other bulk e-mailers have been accused of spoofing addresses, cloaking headers and sending out millions of scattershot e-mails for various schlocky schemes and products, Hardigree says his business is on the up and up. For example, all e-mails are signed with Internet Media Group's return address and are clearly labeled as one-time-only offers; recipients are automatically dropped from the list if they don't respond. And Hardigree steers clear of pornography and get-rich-quick schemes.

Hardigree positions Internet Media Group as a boutique service that sends out targeted e-mails to groups of about 25,000 people who might be, say, cigar aficionados or golf enthusiasts.

This particular morning, as he's preparing to send out a mailing that invites computer professionals to a job fair called Tech Expo 98 in Hartford, Conn., the phone rings. Hardigree chats with a list broker looking for names of marketing managers in St. Louis and Kansas City, Mo.

Hardigree will have no trouble coming up with the list because he has a database of 12 million e-mail addresses. He built the database using customized software that trolls newsgroups for names and by striking deals with companies that run sites where customers volunteer information about their hobbies and buying preferences.

Using Microsoft Corp.'s Access Software, Hardigree is able to develop lists in more than 2,000 categories. Because accurate lists are the lifeblood of his business, he has a full-time employee who does nothing but perform "list hygiene," which includes deleting invalid addresses and fulfilling removal requests. In fact, Hardigree says he completely updates the database every three to four months.

The phone rings again, and it's a potential customer from Israel asking about pricing. Internet Media Group's pitch is compelling. Hardigree

PAUL MORRIS

"I'll keep doing *targeted unsolicited e-mail as long as we fall within the legal boundaries," Hardigree says.*

charges a flat rate of $35 per 1,000 names with a minimum of 10,000 names per order. Plus, there's a $100 fee for setting up a POP3 mail account in the client's name.

That's basically 3.5 cents per name, and Internet Media Group does it all: from sending out the e-mail to filtering and sorting the return mail to delivering a list of respondents to the client.

And there's no way snail-mail can compete on price. When you add up the cost of the list itself, plus the postage, paper and envelopes needed to send out hard copies of marketing material, the average cost runs about $1 per piece. And his e-mail gets out as fast as his Sendmail 8.8 shareware can batch the various domains to which the mail is being sent. Plus, the response rate is the same for regular mail and e-mail, averaging between 2% and 3%, Hardigree says. And the results come back a lot quicker.

While Hardigree is positioning himself as the anti-Sanford Wallace, it was Wallace who provided the inspiration for Hardigree's new career. Hardigree had a well-paying job in direct mail marketing when he got himself an America Online account and was immediately spammed by none other than Cyber Promotions.

"I'll never forget the first day I got e-mail," Hardigree says. He was intrigued, but realized that "the guy is doing it all wrong." Hardigree started researching the idea of using the Internet for targeted marketing and, despite having a wife and newborn to support, within weeks he had quit his job and ventured out on his own. "I felt confident I could move those lists," he says.

Fighting for survival

Little did Hardigree know that moving lists would be the least of his problems. Cyber Promotions and its cohorts in the bulk e-mail business created an antispam backlash that Hardigree has been unable to avoid.

Angry e-mail recipients have called him directly or sent flame mail, sometimes copying it to his upstream ISP or to the Federal Trade Commission. One day, someone launched a SYN Flood denial-of-service attack that took down his entire system. "I watched each machine go down, boom, boom, boom," Hardigree says.

The most serious threat to his business came when his local ISP, responding to complaints received by his upstream provider, cut off his ability to send e-mail. He managed to work out an arrangement to co-locate two servers with an ISP in Phoenix "who understands how we operate." But he still has to worry that his connection could be cancelled again or that legislation will wipe out his business.

So Hardigree is hedging his bets. He is creating a Web site, edirect.com, at which consumers can enter information about themselves with the understanding they will receive e-mail only on topics they select. The site uses free prizes as a lure. Hardigree says his long-range plan is to transition out of unsolicited e-mail, which is also known as the opt-out model because recipients typically have to ask to be removed from the mailing list. He wants to become a leader in the opt-in movement with his edirect.com site.

However, Hardigree isn't getting out of the unsolicited e-mail business just yet. The edirect.com site is just getting off the ground, and he says, "I'll keep doing targeted unsolicited e-mail as long as we fall within the legal boundaries."

The difficulty of running a start-up business in such a controversial field has taken its toll on Hardigree. "My wife has seen me age 10 years in the past two and a half years," he says.

When Hardigree or his wife mention direct e-mail marketing in social settings, people are usually intrigued, but they occasionally make the connection to spam. "It's a little unfair," he says. "They associate any type of direct e-mail with spam."

But Hardigree is sticking to his guns. "This is a viable service and a great service if it's done right and responsibly," he says. "I've got a daughter, a wife, family members. I want them to be proud of what I do," he says. Despite the negative connotations that come with the territory, Hardigree says his wife is totally supportive. "She knows I love this," he says. "This is my destiny." ■

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Two steps toward thinner clients

SAM WARD

Microsoft Terminal Server Edition lets Windows NT Server support multiple network users, while Citrix's MetaFrame add-on scales it for the enterprise.

By Rawn Shah

One of the hottest issues in networking is the emergence of cheap desktop machines running applications on powerful servers. This month, Citrix Systems, Inc. and Microsoft Corp. will ship complementary server-based products that, based on our tests, promise to add more fuel to that fire.

Microsoft, which knows a revenue opportunity when it sees one, has created a product to power the server side of the network computing equation in Windows NT 4.0 Terminal Server Edition (formerly code-named Hydra). Windows NT Terminal Server Edition (TSE) isn't an additional module to NT 4.0; it's more like an alternate version of the operating system, using system code licensed from Citrix. Applications run directly on the TSE server.

Citrix MetaFrame, formerly code-named pICAsso, is an add-on to TSE. MetaFrame provides support for Citrix's Intelligent Console Agent (ICA) protocol and offers features such as support for non-Windows clients (see graphic, page 52). It can also balance the user load across a server farm, and monitor and remotely control user sessions.

We put Beta 2 versions of both products to the test to find out how functional they and the network computing model really are. We found the products are appropriate for workgroups of users running multiple applications, as long as the applications are not graphical or compute-intensive in nature. We saw no noticeable delay when editing documents on a word processor or when working on a spreadsheet. TSE is right for groups of as many as 25 Windows users, but with MetaFrame's load-balancing addition, it can scale up to thousands of users on a variety of platforms.

Performance: moderate

While performance is crucial when you consider implementing one of these products, it's also one of the trickiest factors to quantify. There are no accurate standardized benchmarks to gauge factors such as client response time, network response and server load in multiuser installations. In fact, existing benchmarks give the wrong impression of these products because they test only the performance of the application running on the server, which yields the same results as running the tests on a straight NT system. To test responsiveness, we had to resort to the old-fash-

Net Results

	PROS	CONS	
MetaFrame *Citrix Systems, Inc.* *(954) 267-3000* *www.citrix.com/products/metaframe.asp*	▲ More client platforms supported than TSE ▲ Load balancing provides enterprise-level scalability ▲ ICA communications protocol works over many network protocols ▲ Encrypted version of ICA protocol available	▼ None significant	Each MetaFrame user requires a licensed version of Windows NT Server 4.0 Terminal Server Edition and appropriate client licenses. **MetaFrame** – $4,995 for a 15-concurrent user license. Additional 5-, 10-, 20- and 50-concurrent user licenses available for $995, $1,995, $3,990 and $9,975, respectively. **Load Balancing Services** – $1,495 per server **SecureICA Services** – $2,495 per server
Windows NT 4.0 Terminal Server Edition *Microsoft Corp.* *(425) 882-8080* *www.microsoft.com/NTServer/Basics/Future*	▲ Solid Windows NT 4.0 application support	▼ Concurrent user licensing not available ▼ Overall performance seriously affected by graphics applications ▼ RDP protocol is untested in large-scale environments ▼ No support for non-Windows clients	Each TSE user requires an NT Workstation License and an NTS Client Access License. **NT Workstation License** – $250 each. $99 each for upgrade from Windows 95, any 16-bit Windows versions, and any OS/2 version. Not valid for DOS. Must purchase two-year maintenance contract at $150 per seat. **NTS Client Access License** – $39 each (1 to 10 users), $25 each (above 10 users) **NT Server 4.0 base license** – $627

ioned approach — real people doing real work with actual applications.

We tested the two systems by timing keystrokes and commands typed at the client and measuring how quickly the server responded. We also watched the server with Windows NT Performance Monitor. Neither method is perfect; Performance Monitor is not an exact tool — the load it places on the server affects the results it reports. And for our small test network, the response time after typing at each client's keyboard varied an almost negligible amount — less than a second. It was like watching a movie in which the voices are ever so slightly out of sync with the motion of the characters' lips. Actively moving entire windows around the desktop, on the other hand, was more jerky.

We started with Microsoft Word, then brought up Microsoft Excel at the same time, first using the MetaFrame and TSE client software separately. We then mixed the two, with one client accessing the server through MetaFrame and another accessing the server through TSE. Finally, to toss a wrench in the works, we ran the Pinball game from the Microsoft Plus! Pack, an animated application that demands close to real-time responsiveness. While you probably wouldn't install Pinball on your multiuser system, it served as a stand-in for the kind of complex (and, unfortunately for us, far more expensive) CAD or graphics-intensive applications many organizations use.

Both products essentially work by transferring views of a session screen across the network. This approach means that applications such as Pinball, which display many moving graphics or require active user input, tend to be slow — really slow. With just one instance of Pinball running on one remote client, we were able to slow response time noticeably for all other sessions. Even without Pinball, some Web pages with active graphics displayed slowly, even when cached. On the positive side, common applications such as Microsoft Word, Excel and PowerPoint worked fine in a multiuser environment. Considering the size of these applications, it was surprising to see them working so smoothly.

Another surprise was the good performance for remote users. Dial-up access to the server at 33.6K bit/sec worked just as well as the LAN systems, until we tried to run two or more active applications at a time. When we edited a document while downloading a Web page in two separate active windows, the cursor on the word processor stopped for several seconds while the client tried to catch up with the graphic updates on the browser.

Using MetaFrame's audio capabilities over a dial-up connection is not suggested. Poor remote system response gave us audio that was too choppy to understand. However, audio playback over a LAN sounded very good at CD-quality 44KHz.

There was practically no difference in performance between clients running applications on the server through TSE's and MetaFrame's respective protocols.

By default, the client software for TSE and MetaFrame opens a window on the NT desktop that displays remote applications as subwindows. MetaFrame allows you to bypass this desktop view if you just want to launch a single application within what Citrix calls a seamless window. However, we found this tactic made no difference in performance.

Administrative tools

While performance wasn't a distinguishing factor between the two products, the quality of their administration tools was. What we discovered lacking in TSE was made up for in MetaFrame. In fact, the tools with TSE are very similar to those available with Citrix's older WinFrame product, leading us to believe Microsoft really didn't put much effort into developing a single, cohesive administration tool. The tools have yet to be certified for the Microsoft Management Console.

Microsoft released TSE with a few separate administrative tools that should have been combined into one because they all perform different functions of multiuser administration.

Terminal Server Administration software lets you monitor current connections to the server and the processes it is running. You define the default behavior for the session through the Connection Configuration tool by setting the

Score Card

	MetaFrame	Windows Terminal Server
Administration (50%)	8 x .5D = 4.00	7 x .50 = 3.50
Performance (30%)	6 x .30 = 1.80	6 x .3D = 1.80
Installation (10%)	8 x .1D = 0.80	8 x .1D = 0.80
Documentation (10%)	5 x .10 = 0.50	6 x .1D = 0.60
Total score	7.10	6.70

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given to each category in determining the total score.

Protocols differ

The core difference between Windows NT 4.0 Terminal Server Edition and MetaFrame is the protocol the clients and the server use to communicate. Both are proprietary implementations, but of different origins.

Citrix Systems, Inc.'s Intelligent Console Agent (ICA) protocol has its origins in OS/2. WinView, the company's first product, let remote users access 16-bit Windows applications running on an OS/2 server.

Microsoft Corp.'s Remote Desktop Protocol (RDP) is based on the International Telecommunication Union's telecommunications standards division's T.120 series of protocols. Originally designed for videoconferencing, this family of protocols has been layered on top of a diverse set of network protocols and media.

In particular, RDP is an extension of the T.128 standard for Multipoint Application Sharing. Microsoft's version has been modified to work in point-to-point mode (between the client and the server) rather than in a multipoint configuration (among several peer machines) as defined in T.128.

RDP lags behind ICA when it comes to the features it supports. The table below describes the differences between the two protocols.

COMPARING NT TERMINAL SERVER EDITION AND METAFRAME PROTOCOLS

	Microsoft RDP	Citrix ICA
Standard basis	Proprietary extension of T.128	Proprietary. Developed by Citrix
Network or transport protocol support	TCP/IP	LAN: TCP/IP, IPX, NetBEUI. WAN: PPP, async modem, ISDN, frame relay, ATM
Data compression	No	Yes
Packet-level encryption	No	Yes, Secure-ICA version
Works with RAS*	Yes	Yes
Administrative remote session control	No	Yes
Can disconnect sessions	Yes	Yes
Desktop/application access	Desktop view only	Desktop view; independent "seamless" application windows
Desktop window sizes	640x480, 800x600, 1024x768, 1280x1024, 1600x1200	640x480, 800x600, 1024x768, 1280x1024 or custom
Client color modes	16, 256 colors	16, 256 colors
Network audio	No	Yes. Compression available
Client local device access	Yes (printers only)	Yes (modems, printers, serial ports)
Client local device sharing	No	Yes
Client local hard-drive access	Yes, local drives letters remapped	Yes, local drive letters remapped
DOS client support	No	Yes
16-bit Windows client support	Yes	Yes
32-bit Windows client support	Yes	Yes
Unix client support	No	Yes, with Unix ICA client (Solaris, AIX, HP-UX)
Other clients	None	Java, MacOS, OS/2, ActiveX

* Remote Access Services on NT

threshold for when an idle connection times out, defining what to do with broken connections, and determining whether users are allowed to log on automatically to a default account. This tool works for Microsoft's Remote Desktop Protocol and Citrix's ICA protocols. The License Manager and the Component Installer allow you to install user licenses and additional software included in the TSE package, such as Internet Information Server. Finally, NT's standard Performance Monitor tool has been enhanced to let you watch the status of user sessions and system variables associated with them.

MetaFrame's ability to "shadow" another user allows an administrator to view or remotely control a user's session. This is a valuable add-on that TSE does not yet have. It aids greatly in help desk applications and security monitoring.

If you install the load-balancing option for MetaFrame, there is an additional tool to set the parameters that determine the load per server within the farm. This allows a server to automatically reroute incoming logon requests to other servers.

This load balancing depends upon a number of factors — processor usage, memory usage, system page-file usage, process and thread-swapping activity, and the ratio of total connections to free connections. You can set these criteria individually, or to make things simpler, Citrix gives you an Overall Adjustment slider bar that lets you set the overall calculated load of the server, an average of all the other parameters.

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How we did it

We installed the two applications on a small workgroup server with a 266-MHz Pentium II and 96M bytes of RAM, in a configuration designed to support approximately five users. Our client machines were 90-MHz Pentium systems running Windows 95 and Windows for Workgroups 3.11.

We started server-based applications from the clients. We monitored the load and responsiveness of the server through the Windows NT Performance Monitor application. We ran our tests using only Windows NT Terminal Server Edition (TSE) clients, and again using only MetaFrame clients. MetaFrame is an add-on to TSE and uses different communications protocol and client software. We then mixed clients, running TSE and MetaFrame on separate machines concurrently.

Installation

The installation process for TSE isn't too different from that of NT 4.0 — not surprising because it is NT 4.0 with system files modified for the multiuser features. Setup is simple. It took us about 30 minutes to install it.

MetaFrame's installation was equally quick. MetaFrame asks for the product license numbers and the transport protocols to support — TCP/IP, IPX or NetBEUI. Because you can't have the local client hard drives and the MetaFrame server drives mapped to the same drive letters, the product also asks you to specify how local client drives are to be remapped.

With both products, you should

install application software through the Administrator account on the server because the applications' initialization files need to be mapped to a common system directory for all users.

Applications such as Microsoft Office were created for single users. To let you use Office under TSE, Microsoft gives you an application compatibility script you must call from the default start-up command file for each user on your server. In the beta version we tested, only a handful of compatibility scripts are included. Without one, multiple users cannot see an application in their program groups and lack the proper environment variable settings.

By default, all users on the server are automatically configured for an application when you execute the application compatibility script. The default user profile executes a logon script that handles these compatibility issues. If you prefer that some users not have access to certain applications, you can create an alternative user profile for them that will run a different logon script.

After installing the server side, we turned to configuring clients for each product. For the TSE and the MetaFrame client, software installation is simple. The first time around, you have to install each on every client platform from the CD-ROM or through a client software installation diskette you can create with the administration tools.

If you are a current WinFrame customer and are considering upgrading to TSE, you absolutely must have the MetaFrame add-on. It will save you a lot of time upgrading individual clients.

Once installed, both packages allow you to remotely update the client using administration tools.

We installed the 32-bit and 16-bit TSE and MetaFrame clients on our Windows 95 and Windows for Workgroups 3.11 client desktops, respectively. The installation of the software is fairly automatic. You need to configure specific sessions for each client to allow users to connect to servers or specific applications on servers. This can be a tedious process to do separately for each client, so it's best to preconfigure this information into the client software installation diskette.

Once the software is installed, you have to configure a user session to the server using the Client Connection Manager. This involves specifying the server name, user information, window size, bandwidth information and the default application, if any, to launch upon logon.

Conclusion

Our bottom line: Don't expect either of these products to provide clients with the kind of performance and response time that an NT 4.0 system on their desktop would.

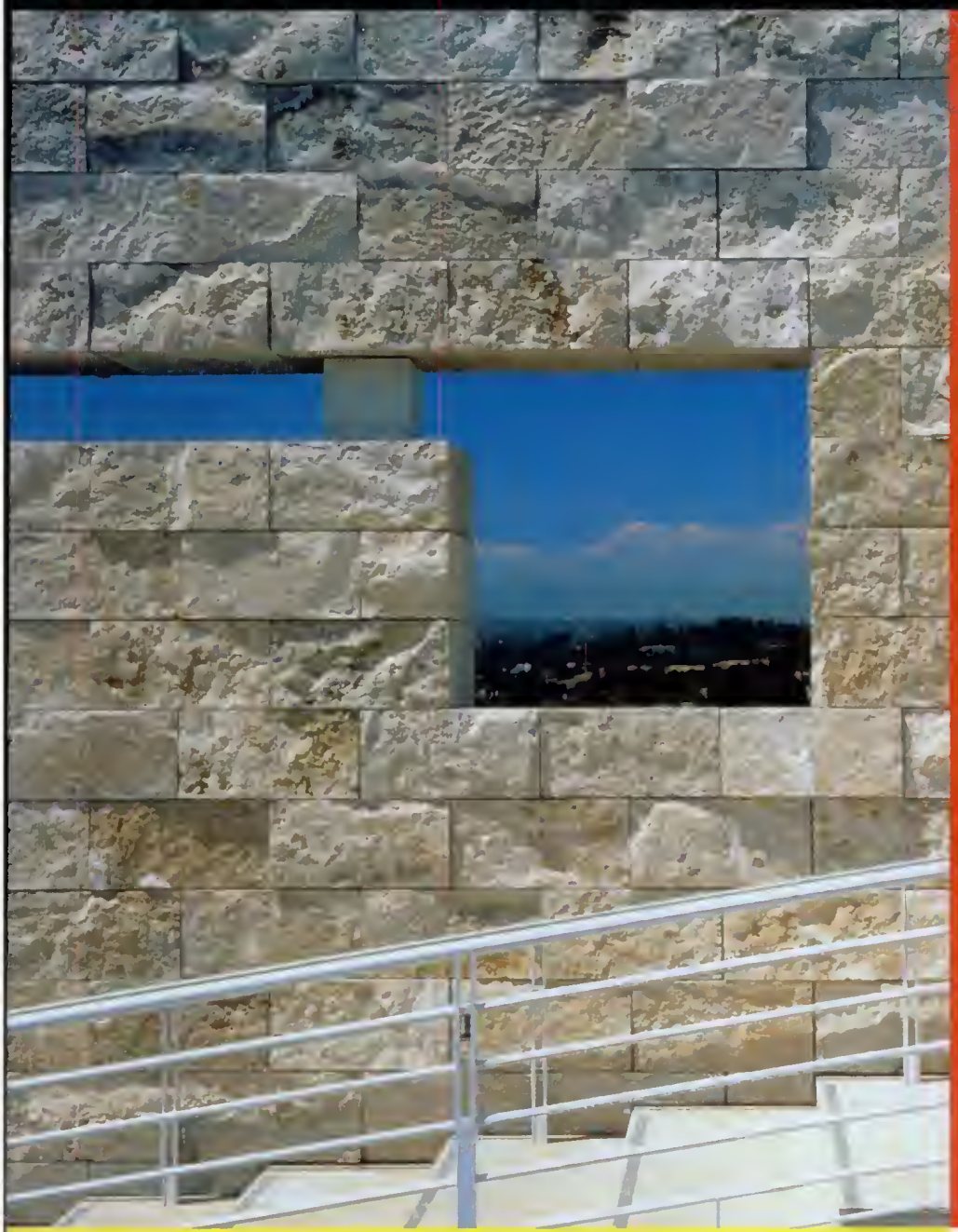
If you are a current WinFrame customer and are considering upgrading to TSE, you absolutely must have the MetaFrame add-on. It will save you a lot of time upgrading individual clients and will allow you to use non-Windows platforms as clients just as WinFrame does.

Shah has been writing on network topics since 1994. He is an independent consultant in Tucson, Ariz. He can be reached at rawn@rtd.com.

What the lawyers say

By the terms of an agreement last year between Microsoft Corp. and Citrix Systems, Inc., Citrix does not have a license to create versions of its WinFrame product based on Windows NT 4.0 or above. WinFrame does not directly compete with Microsoft's Windows NT 4.0 Terminal Server Edition (TSE) because WinFrame is based on Windows NT Server 3.51, but many applications will still run on both. You can think of TSE as WinFrame++.

The Getty Center hosts 1.3 million visitors per year.



Who helped the Getty Center build their high-speed switched network?

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Covering 110 acres, the Getty Center was conceived and built by the J. Paul Getty Trust to unite its museum, institutes, and grant program on one site. "We were given the opportunity to do it right when it came to building our network from the ground up," says Bryan Moye, network analyst for Getty Information Technology Services. "We went to Xylan as our partner in this endeavor when we found that all of our network requirements could be met with the OmniSwitch. Every other vendor's solution required multiple boxes, which when taken together still couldn't do all the things that the OmniSwitch can do."

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Hey, I'm tripping, man

DeLorme's Tripmate is the coolest tool to cross my desk this year.

First, it gets looks. It's a bright canary yellow plastic global position satellite receiver with a cable that attaches to your notebook computer's serial port.

But what's really cool is what it can do. Tripmate comes bundled with DeLorme's Street Atlas 5.0 program, which lets you view and plot routes between any two addresses in the United States. A spot-check of a few locales I know well showed the software isn't perfectly accurate, but mistakes are bound to creep in when you aim to show every street in the U.S. Tripmate also works with the vendor's Map 'n' Go software.

I tried out the hardware/software combo to plot the quickest route from the *Network World* office just west of Boston to a recent editorial conference in Newport, R.I. I also asked the software to choose the quickest route to Newport from my home. Although my home is only a half mile from the office, Street Atlas plotted completely different, though equally timely, routes.

Rather than lug a PC Card CD-ROM drive with me, I exported data from the program's CD-ROM onto the hard drive of the laptop.

I then took the trusty Toshiba outside and propped it up in the passenger seat of my old Mercury station wagon. (What, you thought this job was glamorous and lucrative?) I placed the Tripmate attachment on the dashboard where it could see the satellites, even through the driving rainstorm we were having.

Quick takes on high-tech toys by Test Center Director **Lee Schlesinger**

While I drove, Tripmate showed the current location and direction of travel on the screen, and traced the route in green on the map. When it was time to turn, the laptop came alive and a synthesized voice gave directions. Unfortunately, I couldn't turn the Toshiba's speaker volume up enough to hear what it was saying, but I knew that every time I heard a noise that sounded like squeaky windshield wipers, a turn was coming up.

I did fine until the laptop's battery ran out, and by then I was almost at my destination. Sure enough, the route the software planned took less time than the roads taken by some of my colleagues.

For salesmen who have to travel to new sites with any frequency, or for anyone who hates to ask for directions when he's lost, Tripmate makes a fine navigator. ■

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Management Strategies

Tapping teen talent

Some IT departments are coping with staffing shortages by giving summer jobs to tech-savvy students.

By Loretta W. Prencipe

His job isn't mission-critical, but Matt Murray is happy to do work other IT professionals find tiresome. He reviews and inventories computer shipments, helps troubleshoot network and workstation problems and handles the monthly antivirus software upgrades.

Murray is a paid intern who performs at a junior tech level at MetaCreations Corp., a computer game developer in Carpinteria, Calif. "He's very good," says his boss, Paul Fritz, a technical services manager. "In fact, I haven't had to do a whole lot of technical training with Matt." That's not bad for an employee who this month graduated from high school.

No more flipping burgers — summer jobs have gone high tech. Pit the IT industry's exponential growth and backbiting competition for good employees against a young, motivated and relatively cheap talent pool, and recruiting tech-savvy teens makes good sense.

"We are definitely tapping talent early. It's so competitive out there, you have to get them over on your side," says Kurt Krieger, intranet Webmaster with BDM International, Inc., an IS company in Fairfax, Va.

Krieger's intern started slowly. "I did a little bit of grunt work in the beginning to get familiarized with the environment," says Justin Wienckowski, a 1998 graduate of the Thomas Jefferson High School for Science and Technology in Alexandria, Va. Wienckowski then flew solo on an important project. With little supervision, he analyzed three Web front ends for BDM's databases.

Krieger was satisfied with Wienckowski's thorough evaluation of the programs, his detailed final report and the one-page brief he prepared for management. "It's clear in my mind which product will meet our needs," Krieger says. "I'm not sure what I would have done without him."

Not only does Wienckowski enjoy his work, but he makes approximately $8 per hour. That's fairly good money compared to minimum wage, and he doesn't even have to wear a uniform.

An after-school job for some kids used to mean pitching in at the family restaurant. Today, mom and dad own a high-tech firm, and junior's running the network. That's the case at Communications Specialities, Inc., a video peripherals manufacturer in Hauppaguge, N.Y Even if he is the boss' son, 18-year-old network guru Chris Lopinto is no fly-by-night operator. He's been overseeing the company network for two years. Lopinto installed a Windows NT network and spearheaded a recent conversion from dial-up Internet access to T-1 service. But he feels the pressure of working for his dad's company. "I know if I screw up, I'll hear about it," he says.

KIM KULISH

Recent high school graduate *Matt Murray has found a comfortable spot in game developer MetaCreation's technical services department.*

The tech prodigies start young — often experimenting with computers at home. They take computer science classes in high school, learning advanced placement programming languages.

"These students are young but brilliant. They can show me specific technical things I couldn't figure out on my own," says James Ellenbogen, a principal scientist studying nanotube electronics at Mitre Corp., a federally funded research center in the Washington, D.C. area. Ellenbogen views Mitre's unofficial — but large — intern program as a chance to develop and mentor young talent. His interns needn't be the most experienced, but they must show potential and ask for the job. Ellenbogen calls this star quality "self-directed."

"When I came [to Mitre], I was a novice at everything," says 18-year-old Marshall Smith, a graduating high school senior. He began his stint working on a Web page. His work was good, and his potential was great. This summer, Smith will work with Ellenbogen on cutting-edge nanotube electronics research.

Most companies can't provide research opportunities for their interns. But businesses that view these students as cheap labor might be a bit short-sighted. "I'm surprised that more companies are not interested in development of young talent," Ellenbogen says. "I'm a believer in young kids and students. Treat them in an encouraging way — even if they aren't a big help in the beginning. They become a great benefit to a great company."

Mitre and MetaCreations have found more than interns in the teenagers they've dealt with; they've found dedicated, long-term employees. MetaCreation's Fritz says, "In just about every case, our interns continue to work with us through high school and college. There's always a place for them."

Prencipe is a freelance writer and attorney in Springfield, Va. She can be reached at LWPrencipe@mailexcite.com.

A FEW GROUND RULES

- Introduce the intern to members of your department.
- Give step-by-step instructions on projects until your intern is up to speed.
- Remember that it takes time to learn the ways of the corporate world.
- Get the word out that a stupid question beats a costly mistake.
- Explain how your department works and is perceived within the company.
- Help the intern develop the interpersonal skills needed to handle difficult end users.
- Cover the corporate dress code and other social rules when the intern starts.
- Don't forget that a gifted teenager is still a child.
- Think of yourself as a mentor rather than boss.
- Keep in mind that students have other time commitments.

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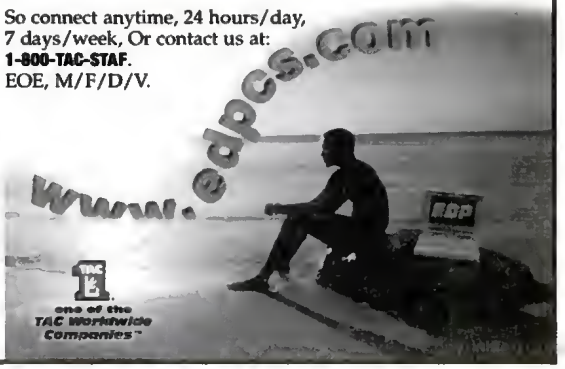

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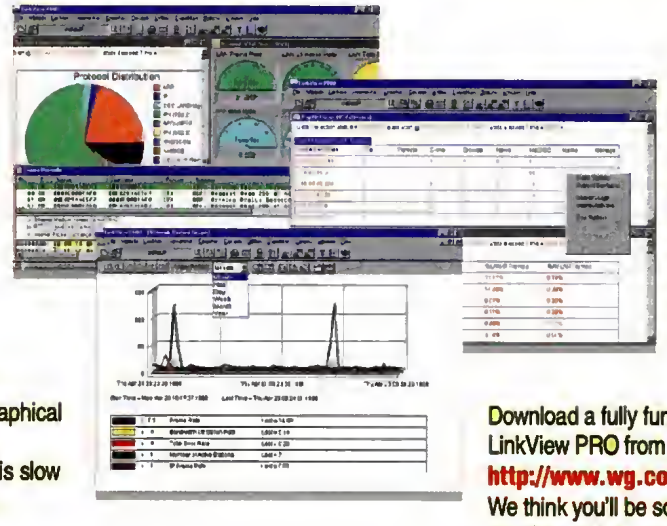

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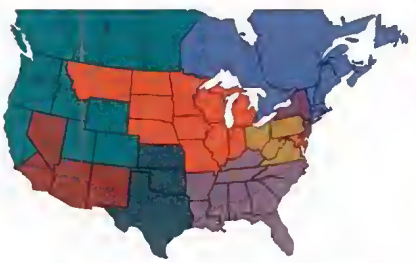

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Nortel/Bay

Continued from page 1

But for all of the apparent synergies — Nortel is the No. 2 supplier of telecommunications equipment to carriers, while Bay is a leading data network supplier to the enterprise — skepticism about the deal abounds.

Nortel stock dove 15% when the deal was announced, effectively erasing almost $2 billion of the transaction's initial value of $9.1 billion. And Bay shareholders have already begun suing Nortel, alleging that the company's 35% premium on Bay stock is insufficient.

And it's not just Nortel and Bay stockholders who may have trouble with the deal. Private capital sources also have expressed skepticism.

One analyst who asked not to be identified said that at a recent venture-capital dinner he attended, the moneybags panned the anticipated deal.

"They said anybody who buys Bay or 3Com [Corp.] we would consider to be stupid companies because anybody who's talented has left those companies and started other companies," the analyst said.

Perhaps. But there's a lot of that going around.

Nortel's purchase of Bay is only the first in an anticipated series of marriages between data and telecommunications giants (see sidebar).

Lucent Technologies, Inc. has been on a tear, buying up ATM, Gigabit Ethernet and remote access vendors, and analysts said the company is not done.

Observers also expect Alcatel N.A., Ericsson and Siemens AG to bid for the likes of Ascend Communications, Inc., Cabletron Systems, Inc., FORE Systems, Inc. and 3Com.

"If you're 3Com or you're Cabletron, you have to be walking around with a smile on your face right now because somebody from Lucent is going to be knocking at your door," said Rick Malone, principal at Vertical Systems Group in Dedham, Mass.

If there is one catalyst behind this tidal wave of industry consolidation, it is the World Wide Web. The Internet is forcing voice-proficient telecommunications companies, such as Nortel and Lucent, to bulk up their data arsenal because they recognize that IP is the next dial tone.

"Data has a growth rate of 30% to 40% per year, and it's driven by the Web," said Nortel CEO John Roth. "The IP component is growing more like 70% per year. That's really the segment we're focusing on."

Nortel rival Lucent will also focus on that segment as Lucent responds to this deal, which analysts say the company will be forced to do.

Because it lacks basic LAN and WAN infrastructure items, such as shared Ethernet hubs and low-end routers, Lucent has relied on a 1995 agreement with Bay to provide complete multivendor network installations to customers. Lucent's NetCare network-integration and support division has handled many of these projects.

The Bay relationship has been critical for Lucent to maintain its foothold in the enterprise while it rolls out its own product lineup.

Lucent has nearly 2,000 salespeople trained to sell Bay products, analysts from Gartner Group, Inc.'s Dataquest division estimated. And NetCare is the largest single provider of continuous support to Bay customers.

The dilemma: Bay's new owner is Lucent's long-time archrival for circuit-switching gear in enterprise and carrier networks. What's more, both Nortel and Lucent have announced almost identical plans to break into the "Big Four" pantheon of internetwork vendors — which Nortel will have achieved if the Bay acquisition goes through.

"It's clear that [Lucent's] relationship with Bay, once this thing closes, is dead," Malone said. "[Lucent] will have to respond with another set of products that replace Bay's. They just can't go on selling Bay equipment if Bay is owned by their No. 1 competitor."

A Lucent spokesman said the company will continue to support its current Bay installations. He also insisted that Lucent will indefinitely continue to sell Bay products as part of its multivendor packages. Most analysts found that last part hard to believe.

"They're going to have to sever that relationship," said Peter Bernstein, president of Infonautics Consulting, Inc., a research firm in Ramsey, N.J.

Dataquest also rushed out a client alert predicting that Lucent's relationships with Bay will be terminated as soon as Lucent is able to announce a "viable strategy" for complete LAN/WAN networks.

"It's simple," said Dataquest Principal Analyst Christopher Thompson. "Nortel doesn't want Lucent in its customer base, and Lucent doesn't want Nortel in its base."

Thompson agreed that existing Bay customers under Lucent support contracts will not be let go. But he predicted they eventually will migrate to Nortel support contracts.

While Lucent will be forced to respond to the Nortel/Bay union, Cisco Systems, Inc. may not have to. As the worldwide leader in data networking for the Internet, the game is coming to Cisco.

"Cisco has seen this type of market movement coming a long way off," said Fred McClimans, CEO of Current Analysis, Inc., a consulting firm in Sterling, Va. "Cisco had already started down the road

THE NEW LINEUP

The market strengths and weaknesses of the biggest internetworking vendors and wannabes:

PROFILE:	CISCO	LUCENT	NORTEL/BAY	3COM
Carrier equipment	Routers make up 80% of the internet backbone. StrataCom switches are linchpins of AT&T public frame relay net.	Heavy in circuit switching; big new push into IP; lagging in ATM and frame relay.	Powerful in circuit switching and ATM; behind in big IP switch/routers.	Allied with Siemens and Newbridge for desktop to WAN class of service.
Enterprise WAN equipment	StrataCom switches; 12000 and 7500 series routers; multiservice access units.	Betting heavily on ATM; counting on voice/data convergence; pushing quality of service.	Solid second in routers; first in enterprise multiservice ATM switches.	U.S. Robotics dial access gear for service providers; PathBuilder WAN; low-end IP routing.
LAN equipment	Leader in data networking equipment for the enterprise and LAN.	Offering numerous options, including Gigabit Ethernet, but lacks installed base.	Complete line of hubs and switches.	No. 2 to Cisco.
Voice products	Setting the industry pace in integrating voice with IP.	PBX leader; big in call centers; solid head start in internet telephony/fax servers.	Heavy in PBXs and call centers; strong in voice over frame relay/ATM; lacks IP telephony.	PathBuilder WAN switches for integrated voice, data, video based on ATM.
Intangibles	As carrier nets move from packet to circuit switching, Cisco rules. But it must maintain alliances with telecom vendors without threatening them.	Must continue to seek credible data sales channels; pressure on Bell Labs to produce for market.	Research and development must be combined and potential culture clash resolved.	Not likely to remain independent for long.

Takeover rumors abound

Rampant rumors last week on Wall Street indicated that wholesale consolidation among giant network companies is only beginning.

The hottest scuttlebutt included Ericsson buying Ascend Communications, Inc. and AT&T grabbing America Online, Inc. (AOL).

Analysts said telecommunications giant Ericsson is definitely looking to buy a company to give it a bigger presence in the ISP market. Ascend's strengths include the GRF, a gigabit switch/router for ISPs, and core ATM switches.

Ericsson, which makes its own ATM switches, has shown interest in gathering even more ATM technology. For example, it recently invested in Mariposa Technology, Inc., which makes voice and data access gear for ATM networks.

"I think it would be a hell of a good fit," said Brad Baldwin, remote access director for Dataquest in San Jose, Calif.

As for the other rumor of the week, printed reports said AT&T put in a bid for AOL that was rejected. While neither company would comment on the rumor, additional printed reports said that AOL's CEO Steve Case and President Robert Pittman tried to quell employee concerns.

An internal e-mail memo from the executives said AOL would remain independent, but the company is always seeking beneficial partnerships.

If AT&T acquired AOL, it would significantly boost AT&T's consumer presence. AT&T WorldNet has over one million customers, but AOL is clearly the leader in this arena with 12 million. The effect on business users would most likely be nominal considering AOL's primary focus is on residential consumers.

— Tim Greene and Denise Pappalardo

to [playing a bigger role in] the carrier space way back with its acquisition of StrataCom [Inc.] and then more recently with the partnership with Ciena [Corp.] In fact, we expect to see that continue, probably through a strengthened partnership with Tellabs [Inc.]."

Indeed, Cisco Chief Technology Officer Judy Estrin said her company will now look to Tellabs, which recently acquired Ciena for more than $7 billion, for wavelength-division multiplexers. Wall Street analysts say it's possible Cisco will acquire Tellabs.

Barring an acquisition by Lucent, which many analysts anticipate, Ascend needs to continue to upgrade its carrier-class remote access, switching and routing offerings, McClimans said. Ascend also must work more closely with enterprise network companies such as 3Com and Cabletron.

Customer reaction

The response to the Nortel/Bay deal among users, meanwhile, is generally positive.

"We think that's a great thing," said Chuck Beam, manager of telecommunications at Duke Power Co. in Charlotte, N.C., which uses Nortel and Bay gear.

"We've been looking for Bay to get picked up by someone, hopefully someone like a Nortel. There needs to be a stronger convergence of data network equipment and telecommunications equipment, and it's going to take acquisitions like this to make it happen," Beam said.

One big reason for the merger: the uphill battle Nortel would otherwise have to fight to gain credibility in the IP world. ATM vs. IP was turning into a religious battle for Nortel, analysts said, but it was a battle the company was no longer planning to fight in the enterprise.

"From what I hear, [Nortel's] really pressing forward with this acquisition to integrate the technology," said Rick Carpani, a program manager in Florida Power & Light Co.'s (FP&L) Information Management, Telecommunications and Technology division.

"They're not waiting [until] all those [terms and conditions] are completed," Carpani said.

FP&L runs a private 58-node ATM WAN backbone using Nortel's Passport switches and is in the process of evaluating Layer 3 switches for a LAN upgrade throughout the enterprise.

"I think Bay fills a gap that Nortel has in its product line with frame switching," Carpani said.

Union Pacific Railroad Co. in Omaha, Neb., is a Bay shop that sees the Nortel/Bay union as business as usual.

"I don't think much is going to change in the short term," said Brett Frankenberger, systems engineer at the railroad company.

"Longer term, their product lines are so disparate now that I don't know that a whole lot is going to change except the company name," he said.

Indeed, Bay and Nortel executives said there was virtually no overlap in each company's product offerings.

Yet Nortel CEO Roth said 25% of his company's business is in the enterprise, where Bay is the third-largest provider of LAN equipment. And Bay has been attempting to bolster its service provider presence with limited success, analysts said.

Areas for potential overlap are in dial-access and high-end routing.

Nortel acquired Aptis Communications, Inc., a maker of high-density dial access concentrators. Bay, which also courted Aptis, offers the Versalar 5399 concentrator, which is a lower end remote access offering.

For high-end routing, Bay is developing an OC-12-capable router for ISPs that's expected in mid-1999 (*NW*, March 30, page 6).

But Nortel has a 20% stake in Avici Systems, Inc., a start-up developing terabit switching routers for the Internet core.

Nortel's Roth and Bay CEO David House intimated that Nortel may settle on a Bay/Avici hybrid for high-end routing (see interview below). ■

Nortel, Bay executives define the deal

Nortel CEO John Roth and Bay Networks, Inc. CEO David House took time to discuss the deal with *Network World* Senior Editors David Rohde and Jim Duffy:

The merger announcement was all about IP networks. But Nortel's flagship enterprise produet is the Magellan Passport ATM switch.

Are you afraid that your enterprise products will get lost in the shuffle?

Roth: Passport is really a frame relay access device, even though it's based on ATM technology. And frame relay is a prevalent [WAN protocol].

We're taking the point of view that lots of different protocols and products will continue to exist. We're also taking the point of view that quality of service is important, and that's what our technology provides.

Nortel CEO John Roth (left) *and Bay CEO David House (right) are ready to join forces.*

PHOTO BY JASON GRIDLEY

But many ISPs don't like ATM because they believe the overhead in every cell — the so-called cell tax — makes it inefficient compared with transporting native IP packets. Do you agree?

Roth: The cell tax is not a big issue. For example, when you put [ATM on the enterprise], people see a 40% savings in their long-distance because you get the tremendous efficiency of [interleaving voice and data traffic].

Bay is developing a high-end router for ISPs, yet Nortel has a 20% stake in Avici Systems, Inc., which makes terabit routers for the Internet. Which way is Nortel going to go?

Roth: We haven't made a decision there. [Bay CEO] Dave [House] and I both have to look at what we've got under way and the potential of both.

Avici's got some neat hardware but is very, very short on software code; Bay has got three million lines of software code that's appropriate.

House: Our strategy has been to develop products where we have the capabilities and acquire them where we don't. Acquiring hardware platforms to marry with our software would be something, certainly, that we would consider in our acquisition strategy.

We also have internal developments. It's a question of the right set of platforms and one unified set of routing code.

The growth in data networking is really in the public carrier market, whereas the enterprise seems to be leveling off.

Was entry into the enterprise market part of the rationale for acquiring Bay?

Roth: Nortel's business is about 75% carrier customers and 25% corporations.

Bay represents two real values to Nortel. One of them is the Bay technology and leadership at router technology, and the other is the evolution of router technology as it moves up the layers.

[The question now is,] how do we apply that to the traditional Nortel business of carrier-class networks.

As IP traffic becomes a larger and larger portion of the total traffic in the public network, it becomes appropriate to push the kinds of technologies Bay has into the public network. That is a major reason for my interest in Bay and its technology.

The other one is that it really does strengthen Nortel's offering in the [WAN], where we at this time only go to the doorstep of the customer.

On the other side of the WAN product is a whole series of LANs and routers, which Nortel really has little visibility on.

This is, of course, an area where Bay is quite a strong player.

House: What we see is the lines between the LAN and the WAN are blurring and evaporating.

Customers are looking for complete end-to-end IP integrated networks. Cisco with its StrataCom acquisition was able to offer a more complete solution than we were able to offer.

Now we can go to the enterprise customer and offer a solution that is significantly more complete than what our leading competitor can offer.

Mr. House, since you began your tenure at Bay 18 months ago, Bay never made a serious run at Cisco; your third-quarter financials [a $144 million loss] indicate that Bay is susceptible to market volatility, whereas Cisco seems immune; and now you're no longer an independent company.

Do you consider your tenure at Bay a success?

House: Absolutely. I think any time you can double the stock price in 18 months [you've] got to be returning a lot of value to the stockholders. That's the ultimate measure, and I think that's an excellent performance. ■

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Backspin

Handicapped by network politics

"Politics is not the art of the possible. It consists in choosing between the disastrous and the unpalatable."
— John Kenneth Galbraith

I must rectify a mistake I made in this column two weeks ago. I discussed how AT&T had been taken to task by the Federal Communications Commission for announcing it is going to levy a 5% surcharge — the so-called E-rate — on each bill to cover universal service costs.

It turns out all the telcos are going to be doing this, and AT&T is the only one that is upfront about the issue. The rest were planning to slip in the surcharge, hoping we wouldn't notice.

My view had been conditioned by a press release from the FCC (www.fcc.gov/Speeches/Kennard/Statements/stwek836.html), in which FCC Chairman William Kennard severely criticized AT&T's E-rate surcharge.

Kennard declared that AT&T's surcharge announcement was "premature, unwarranted and inconsistent with [AT&T's] public proposals to the FCC. This announcement suggests that AT&T will raise rates to pay for universal service."

He went on to say, "Consumers are enjoying the lowest long-distance rates in history. The FCC will continue to drive long-distance prices down and ensure that consumers get the full story: no hidden charges on their bills and full disclosure of the significant cost reductions they receive."

Sounds good until you read "Press Statement Saluting AT&T by Commissioner Harold Furchtgott-Roth" (www.fcc.gov/Speeches/Furchtgott_Roth/Statements/sthfr827.html), at which point you might, as I did, come to realize that the FCC (once again) is embroiled in politics up to its red-taped armpits.

Furchtgott-Roth points out that "six months ago, the FCC imposed on American consumers a new tax on telecommunications services. It is a tax that is paid by the consumer either through higher rates or through rates that would have been lower without the tax. . . . Surely, American consumers must know they are paying this tax. No, the sad fact is that most American consumers do not even know that they are paying this tax. It does not appear on most bills."

He points out that only AT&T is being forthright about this tax and "on the issue of informing the public, AT&T is on the right side, I salute them. . . . Efforts will doubtlessly be made this summer to silence AT&T and to keep the American consumer in the dark. If, by the end of the summer, telephone customers do not know of the taxes and charges they are paying, it will have been a summer of victory for special interests in Washington and a summer of defeat for the mere American consumer."

I think this disagreement points to the political tar pit the FCC struggles in and the extent to which consumers and businesses are merely pawns.

And while we're talking politics, I recently heard that Microsoft has made a substantial realty purchase in Vancouver, Canada. Now, having an operation in Canada makes sense, but what if the purchase is actually more than that?

Just consider the consequences to the U.S. economy if the Department of Justice's pursuit of Microsoft were to tick off Bill Gates so much that he moved headquarters to Vancouver. It would hardly change life for Bill.

Following that train of thought, imagine Intel getting really annoyed by the Federal Trade Commission. They could relocate headquarters to Canada or even Mexico.

I think that, thanks to the FCC, the DOJ and the FTC, the U.S. is in danger of losing its lead in electronic business. Then again, perhaps it is not too surprising. As Napoleon said: "In politics stupidity is not a handicap."

Get on your soapbox at nwcolumn@gibbs.com or on (800) 622-1108, Ext. 7504.

'Net Buzz

The latest on the Internet/intranet industry

By Chris Nerney

A CAUTIONARY TALE, SET TO MUSIC Three Internet initial public offerings (IPO) rocketed out of the starting blocks in the past few days, bringing joy to the hearts of corporate insiders, early investors and cyberspace stock shills.

And ours too. After all, we like a mad gold rush as much as anyone. We are bullish. We are upbeat. We see the glass as half full, and whatever other platitudes of optimism you want to throw in here.

However, we have seen other things, things that would try the soul of a venture capitalist, if he had one. We have seen what happens after the ticker-tape parade, when the crowd's chant of "visionary" has subsided.

First, though, the feel-good stories, starting with **Inktomi,** the San Mateo, Calif.-based maker of network caching and Internet search engine technologies. When we initially wrote about Inktomi's IPO (*NW,* April 27, page 87), we predicted it would be "one of the more interesting Internet plays of the year on Wall Street."

Talk about understatement. Inktomi, in fact, became the fastest starting Internet IPO since **Amazon.com.**

Debuting on June 10 with an asking price of $18 per share, Inktomi's stock surged almost immediately to more than $40 per share and is currently in the mid-$30s.

Two days later, **NetGravity** entered the fray. Also based in San Mateo, NetGravity makes software for managing online advertising and direct marketing. Opening at $9 per share, NetGravity is now trading around $15.

And last Wednesday, **software.net** of San Jose, Calif., opened strong, its stock price quickly rising almost 50% above the $9 per share asking price. It is now trading around $13. Formerly called **CyberSource,** software.net is an online reseller of software to individuals and businesses.

These three companies deserve to celebrate their good fortune. Perhaps they should throw a party. But where to get the music for the event? How about from **CDNow,** the first online retailer of music?

Last summer we cited CDNow as one of our favorite Web sites (www.cdnow.com). Based in Jenkintown, Pa., CDNow offers obscure CDs you can't find in stores, along with 30-second audio samples of thousands of songs.

After going public in late February with a $16 asking price, CDNow's stock rose slowly through March and then surged to almost $40 in April. Since then it's been almost all downhill, and though the stock's value of $18 or so per share is still above the original asking price, the company canceled a planned secondary offering early this month, blaming a soft market for Internet-related stocks.

It's more likely that CDNow didn't want to get steamrolled by Amazon.com. The online bookseller announced on June 11 it was entering the online music business. Seattle-based Amazon — whose stock has risen from $29 in early January to as high as $82 per share last week — is a true Internet commerce legend, the kind of competitor that chews up vendors with less name recognition and financial muscle. Like CDNow.

CDNow was started by twin brothers **Jason** and **Matthew Olim.** Not since **Milli Vanilli** has a music industry duo's fortunes appeared to have fallen so fast.

WHEN THE MUSIC'S OVER, PART II A couple of years ago, just when Internet copyright issues were first being debated, *Network World* featured a story about a music publisher's efforts to close a Web site that offered sheet music to guitarists around the world (*NW,* March 11, 1996, page 1).

The Online Guitar Archive (OLGA) received a threatening letter from **EMI,** the world's largest music publisher, alleging that the free posting of guitar chords and tablature for songs constituted a copyright violation.

Lacking the resources to mount a court fight, OLGA shut down. But only temporarily. Within weeks the site quietly began adding more songs and offering access to users, without drawing any legal attention.

Now OLGA may be dead for good. On June 9, the site closed in the face of a threat by music publisher **Harry Fox Agency,** which said it would bypass a cease-and-desist order against OLGA and proceed directly with a lawsuit.

Corporate lawyers vs. broke musicians. Who do you think would win?

Ask not what 'Net Buzz can do for you, ask what Internet- and intranet-related news you can give to 'Net Buzz. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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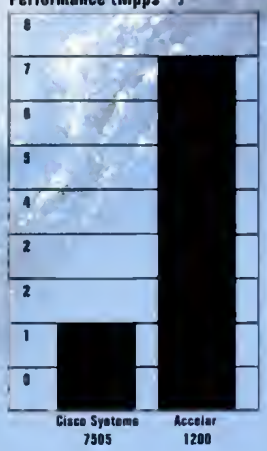

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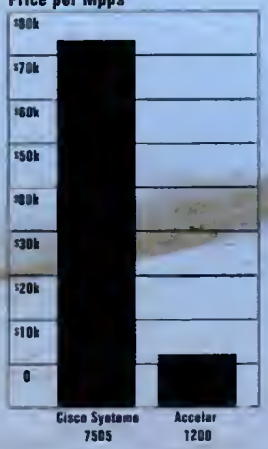

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